Products Finishing

CLEANING
PLATING
POLISHING
FINISHING

MARCH 1953

Cincinnati
CLEANING MACHINE

"Tremendous Time and Labor Saver!"

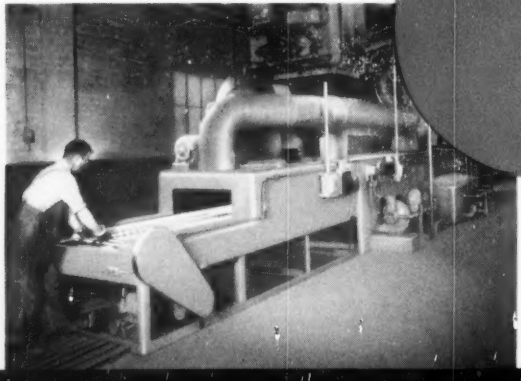
FOR MIDWESTERN MANUFACTURER

time saved . . . 75%
labor saved . . . 81%
results . . . much better

Cleaning steel channel and moulding, this firm formerly used methods requiring the full time of four workers every day. Cincinnati engineers studied the cleaning problem, and adapted a Cincinnati wash, rinse, and dry belt-conveyor washing machine to the job. With this machine, results are "much better," and the work is done by only two operators working just three hours per day.

If you have no automatic cleaning equipment, or if you wish to modernize your present equipment to reduce your costs, consult Cincinnati engineers. From long experience, they can show you by case histories closely approximating your needs how a Cincinnati machine or system can improve your cleaning and reduce your costs.

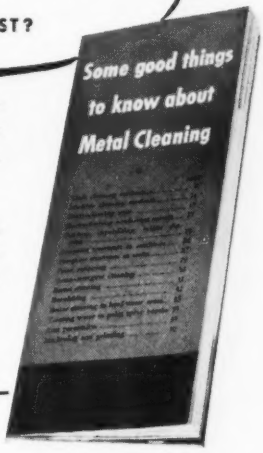
Write for latest literature.



Cincinnati
CLEANING & FINISHING MACHINERY CO., INC.
311 HECLA STREET
IRONTON, OHIO

HOW DO YOU PUT
A HEAVY PHOSPHATE COATING
ON 90 MM. SHELLS?

HOW CAN WE GET
BETTER ELECTROCLEANING
AT LOWER COST?



These are two of the simplest questions on metal cleaning we answer every day. Hundreds of tougher ones are asked of the 180 Oakite Technical Service Representatives throughout the country, or come to us through the mail.

We thrive on questions about tank and machine cleaning, electrocleaning, pickling, preparation for painting, paint stripping, steam-detergent cleaning, barrel finishing, rust prevention and related subjects.

There's space below for asking your metal-cleaning question.

OAKITE PRODUCTS, INC., 20 Rector St., New York 6, N. Y.

Tell me (without obligation) about Oakite methods for removing the following soils:

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☐ **ALSO** send me a **FREE** copy of your booklet "*Some good things to know about Metal Cleaning.*"

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SPECIALIZED INDUSTRIAL CLEANING

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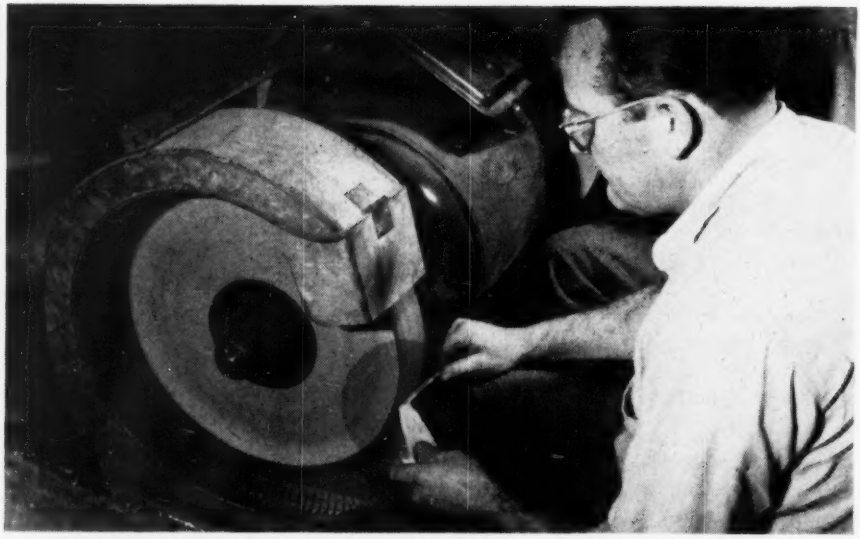
MATERIALS • METHODS • SERVICE



GOLF CLUB HEADS GET THE "TOUCH OF GOLD" as they are precision polished to the desired weight and finish on a grease wheel coated with ALUNDUM* Abrasive.

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For polishing that has the true "Touch of Gold" — that adds most to the usefulness and attractiveness of your products—there's nothing to equal Norton ALUNDUM Abrasive grain.

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of the exact types of ALUNDUM Abrasive you need. He's backed by complete stocks in Chicago, Detroit, Cleveland, Philadelphia, Pittsburgh and Worcester, ready for shipment in container sizes to meet every requirement. And if necessary, he'll gladly call your Norton Abrasive Engineer for expert aid in your polishing problems. Or you can write to Norton Company, Worcester 6, Mass. Distributors in all principal cities. *Export:* Norton Behr-Manning Overseas Incorporated, Worcester 6, Mass.

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ABRASIVES
Making better products to make other products better

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one glance *proves* there's no equal to H-VW-M Bias Sisalweev

See that weave? The sisal is cut *on the bias.* Every fiber is directed *toward* the cutting edge. There's no danger of whole strands flying off at high speed. Every Bias Sisalweev wears *evenly* and outlasts any other design.

You'll find a Bias Sisalweev ideal for heavy cutting down of drawn, stamped, or cast ferrous and non-ferrous articles. You can use it at high or low speeds—it's impossible to scorch at any speed or pressure. And, it's ventilated —24 air channels give extra cooling.

Bias Sisalweev is supplied either treated or untreated, but we recommend the exclusive H-VW-M HC, (heavy cut) treatment. This not only increases the rate of cut, but lengthens wear life and power to hold composition. And for buffing steel, you can't beat the combination of a Bias Sisalweev and H-VW-M 6-B-97 composition for heavy cut or 6-B-66 for medium cut with finer finish.

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PLATEMANSHIP

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MARCH, 1953

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Products finishing

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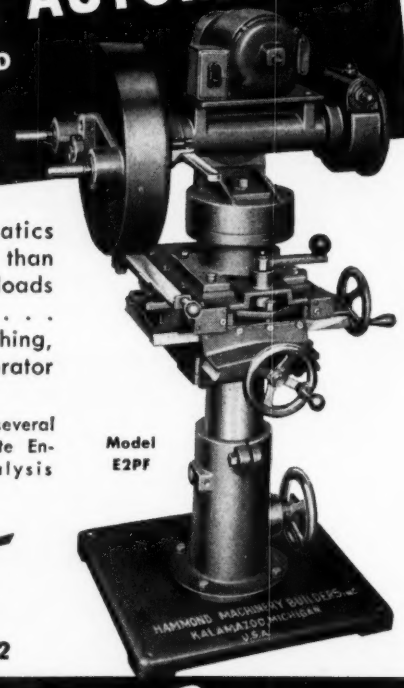

Model E2PF

Users of Hammond Junior Automatics report 3 to 7 times faster finishing than hand methods. The Operator merely loads and unloads the machine, result . . . . faster, better and more uniform finishing, more pieces per hour with less operator fatigue.

SEND SAMPLES: Send us one finished and several rough samples. You will receive a complete Engineering Report and Production Analysis without obligation.

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Commercial rhodium plating was developed in our laboratories.

BAKER & CO., INC.

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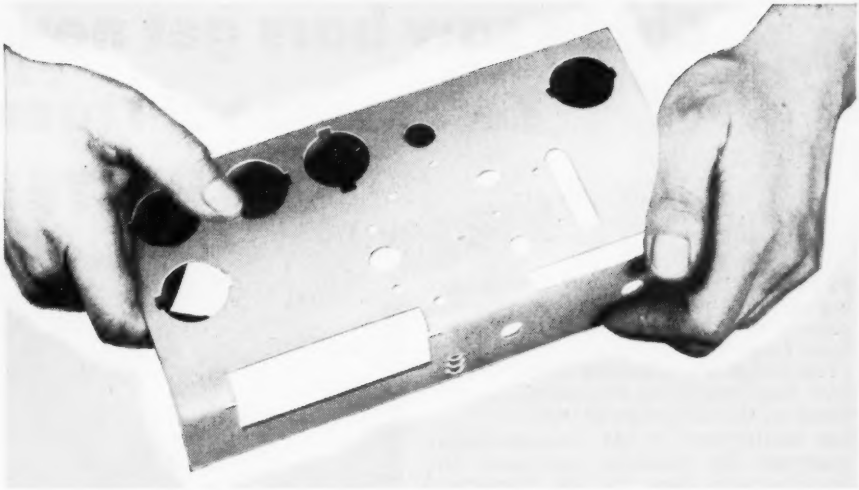
Let us send you "Directions for Rhodium Plating."



COPPER-PLATED PARTS STAY BRIGHT AND CLEAN

When the plating shop treats them with WATER DIP #33

Then you'll want the full story on a simple, low-cost metal treatment that *keeps* the copper surface bright and chemically clean—just as it comes from the plating bath. *Water Dip #33 prevents finger printing and staining during assembly, storage and use.*

you can cut out extra operations by using Water Dip #33. Work goes *directly* from the last hot water rinse into Water Dip #33—no need for rehandling and drying.

you will find that you can make excellent soldered connections, and you can make strong, uniform welds even after the parts have been dipped in Water Dip #33.

Water Dip #33 has many **more** advantages — in many **types** of plating. For the complete story, write for Technical Data Bulletin #117 or let our M & W technical consultant discuss your requirements privately with you.

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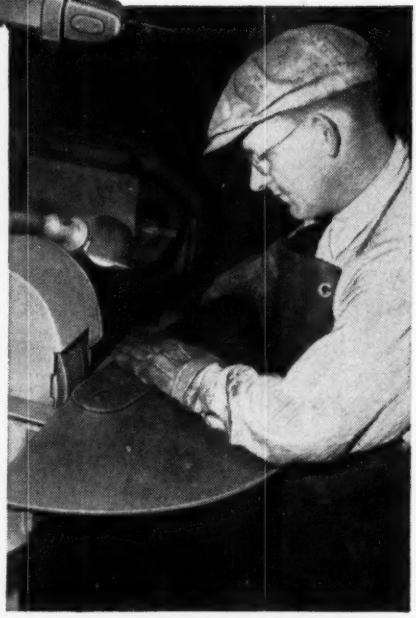
Chain saw bars get new sales appeal from 3M BELTS!

PRODUCTION PROBLEM: To produce a higher finish—with greater customer appeal—on chain saw bars at the Oregon Saw Chain Manufacturing Company. (The maker of the famous ARMOR-TIP Saw Bar desired an appealing, lustrous finish on this alloy-tipped bar).

3M SOLUTION: A 3M Representative analyzed the finishing operation and demonstrated how the 3M Backstand Method using Three-M-ite Cloth Belts would produce a finer finish on the alloy tip than was achieved with a grinding wheel alone. He also recommended the right 3M Abrasive Belt on their Curtis Straight-O-Matic Grinder for final finish on saw bar surface. Previously, manufacturer had used a surface grinder for this operation.

RESULTS! Now this Portland, Oregon manufacturer produces a finer, more attractive finish in less time! Perhaps a 3M Representative can improve *your* company's finishing operations. His training and experience in industrial application of coated abrasives are available without cost or obligation.



WANT MORE INFORMATION?

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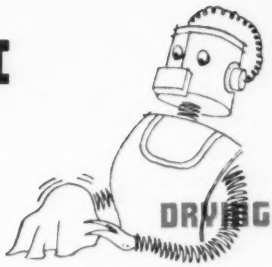
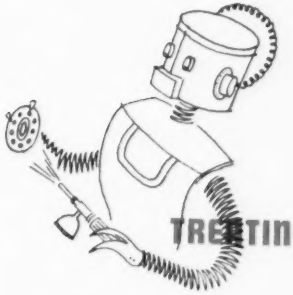


DRYING . .

RINSING . .



TREATING . .

Look to an

INDUSTRIAL WASHING MACHINE

The efficiency . . . the production range . . . and the savings in time and labor provided by **Industrial** Washing Machines . . . are the best argument in favor of this automatic equipment.

Now is the time to rid your plant operation of manual washing methods. And **Industrial** is **the** place to find out how.

Act while this important subject is fresh in your mind. Request full information right away. Address Dept. 21.

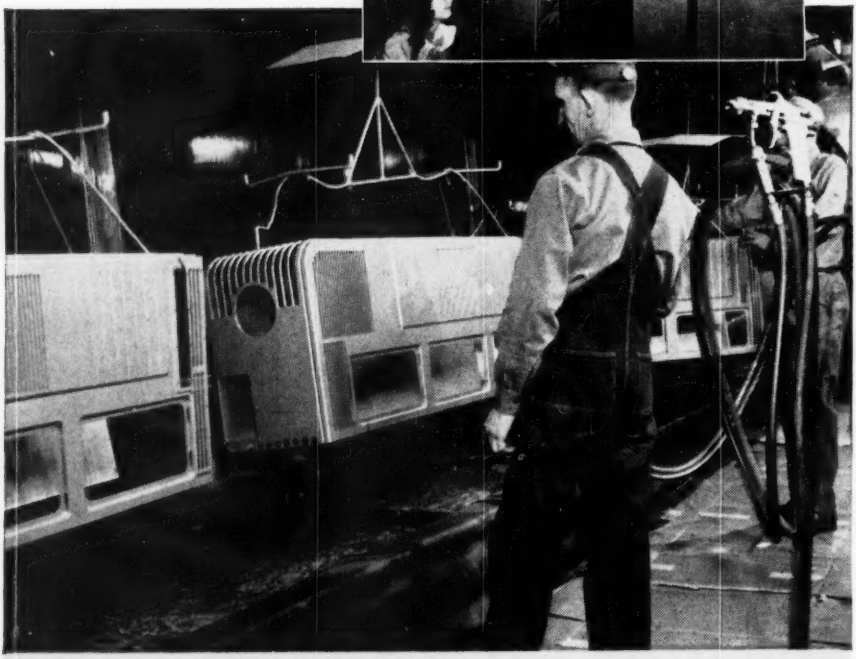
INDUSTRIAL SYSTEMS COMPANY

Exclusive Sales Agents

for Industrial Washing Machine Corp.

New Brunswick New Jersey

Coleman Heating Unit, finished in Pittsburgh Polychromatic Tan Baked Enamel, harmonizes with almost any interior decorating arrangement.



Coleman Model 492 Trailer heater casings being sprayed with Pittsburgh Polychromatic Tan, immediately following the bonderizing process.

PPG

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Leading Manufacturers
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Typical of the way in which Pittsburgh research and technical staffs work with an industry to provide special coatings of unusual quality and performance for its products, are the Pittsburgh Finishes developed for many prominent manufacturers of heating and air conditioning equipment.

The Coleman Company, Inc. of Wichita, Kansas, manufactures heaters for trailers. It uses Pittsburgh Polychromatic Tan Baked Enamel on the casings of these heaters.

This is a very attractive finish with eggshell sheen which adds to the appearance of the unit.

Being neutral, the color blends well with almost any interior color scheme. The coating has excellent adhesion and provides unusual mar resistance at the same time that it fulfills the moderate heat resistance which is required.

Interiors of these trailer heating units are finished with high heat-resisting Pittsburgh aluminum finish.

PITTSBURGH PLATE GLASS CO., Industrial Paint Div., Pittsburgh, Pa. Factories: Milwaukee, Wis.; Newark, N. J.; Springdale, Pa.; Atlanta, Ga.; Houston, Texas; Los Angeles, Calif.; Portland, Ore. Ditzler Color Div., Detroit, Mich. The Thresher Paint & Varnish Co., Dayton, Ohio. Forbes Finishes Division, Cleveland, Ohio. M. B. Suydam Division, Pittsburgh, Pa.

FREE ADVISORY SERVICE

Pittsburgh's broad experience in serving many fields may be helpful in solving your finishing problems. Write, wire or phone the Pittsburgh Paint plant nearest you. We'll be glad to have one of our engineers discuss your requirements with you, without cost or obligation. Such a call may save you time and money.

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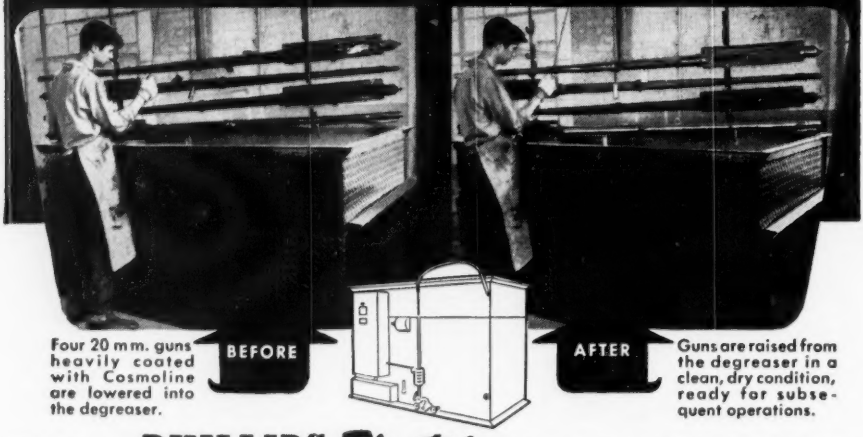
COMPLETELY DEGREASED
IN LESS THAN 4 MINUTES



Four 20 mm. guns heavily coated with Cosmoline are lowered into the degreaser.

BEFORE

AFTER

Guns are raised from the degreaser in a clean, dry condition, ready for subsequent operations.

WITH A PHILLIPS *Electric* VAPOR DEGREASER

Here was a really tough metal cleaning problem. Cline Electric Mfg. Company, Chicago, had to remove Cosmoline from a large quantity of 20 mm. guns before going ahead with modification operations on the guns. Estimating that other cleaning methods would take about 2 hours per gun, Cline purchased a Phillips electric batch-type degreaser to handle the job. As a result sixteen guns are being degreased per hour *at a savings of 85% on cleaning costs per gun.* Cline reports that the degreasing operation thoroughly prepares each gun for subsequent operations.

Here is another instance of how Phillips degreasers cut manufacturing costs through faster, more thorough, more economical metal cleaning. If you have a degreasing problem, check with Phillips. Our engineers will be glad to recommend the right machine for your job from Phillips' complete line of standard degreasers.

SEND FOR YOUR FREE COPY OF NEW ILLUSTRATED DEGREASER BULLETIN

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News about UNICHROME

Trade Mark

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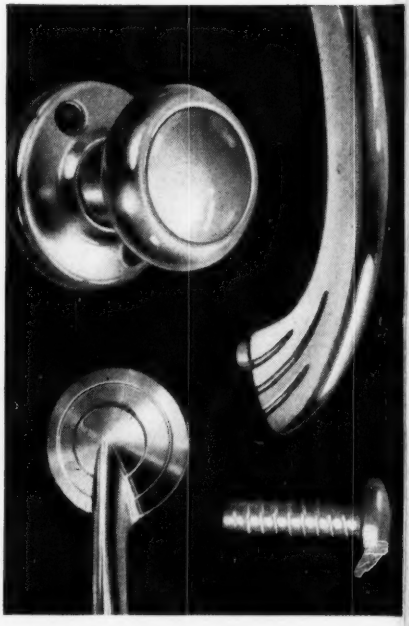
Platers have found it easier to meet stepped-up production schedules with Unichrome S.R.H.S. Chromium. It speeds up plating time by 20 to 80%. It plates smoother, with less "treeing." This means less need for depositing excess chromium to allow for grinding and final finishing. With higher cathode efficiency, this chromium bath uses less power to deposit the specified chromium, thereby increasing capacity of existing equipment. It also assures top throwing power, minimized control and fewer rejects through its self-regulating feature.

STEADY POWER FOR PLATING OR ANODIZING

Power supplies such as Unichrome Selenium Rectifiers offer you an "edge" today. You get units built to withstand plating room conditions, in sizes from 250 to 10,000 amperes, and you get them fast. In short, no need for long delay, or costly installation of more capacity than you can use, or frequent maintenance.

Brilliant



Preventive maintenance saves replacement costs

Today's shortage of metals makes replacement of equipment a serious problem. Many plating plants are, therefore, putting greater emphasis on preventive maintenance. They find that using chemical resisting Ucilon* Protective Coatings on a regular basis avoids corrosion damage to equipment and thereby minimizes not only the need for replacement but also the costly downtime. Applied to structural work, too, Ucilon Coatings keep plants looking better longer and save on yearly painting costs.

**Trade Mark*

Zinc Finish with extra life

in three easy steps

1. *Plating in zinc bath*
2. *Treatment in Unichrome Clear Dip*
3. *Application of an "invisible," clear enamel*

■ Combination finishes have come up as the answer for satisfactory bright finishing today – substituting for the plated finish which requires restricted nickel.

One such outstanding substitute is obtained by using only .0002" to .0005" of ordinary zinc plate and then following up by chemically treating the zinc in Unichrome Clear Dip. It is a fast, economical and easily controlled process, adaptable to manual or automatic operations. The results are startling. The plated steel or die cast product emerges from the solution bright as chromium. This Unichrome Dip Finish is integral with the zinc. It stays bright because of its good resistance to exposure, dulling, and finger-marking – thereby assuring for products not only the appeal of a bright plate but also great rust and corrosion resistance.

A COMPLETE SYSTEM

Application of a clear organic coating usually completes the finishing system. This final step is employed to assure the long service life expected of bright finishes.

A baked-on film of Unichrome Clear Coating B-115, for example, while virtually invisible, resists humidity, handling, discoloration and exposure. Where baking facilities are limited, Unichrome Coating A-140 is applied and then air dried or force dried to give results comparable in corrosion resistance to many coatings that are baked.

PROVED IN SERVICE

The combination of Unichrome Clear Dip and Unichrome Clear Enamel has been used with outstanding success for years on die castings, wire goods, ice skates, bicycle parts and other products and components. It proves that substitute finishes, properly fortified, can be durable and as attractive as the finishes replaced.

Ask for details – write or phone.

UNICHROME
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Pf editorial

MARCH, 1953

Vol. 17, No. 6

Better Finishes----NOW!

Studies of trends in the manufacture and sale of various products over the past 10 years show that sales of products that make for more luxurious living, such as automobiles, home appliances of all sorts, have increased far more, percentage-wise, than might have been expected from the increase of population. For the immediate future sales executives envision a period of high production, since metal supplies for civilian goods are expected to be ample in most cases, and anticipate a period of more competitive selling.

These facts and predictions, of paramount importance to the finishing industry, should provide finishers and finish manufacturers with a sense of pride in past accomplishment, and also serve as an indication of future requirements. The increased production of consumer goods reported (in the main, metal products which have been given a high quality finish to add sales appeal and usefulness) has expanded the finishing field and increased the use of more attractive and durable finishes. Public acceptance of and customer satisfaction with the various products has been aided to a great extent by the attractive, if not striking, surface finish applied to the product, and by the fact that this finish maintains its appearance throughout a reasonable service life. Thus a high quality finish helps the manufacturer keep his product in a strong competitive position.

In the period of increased competition which is predicted, finishes will continue to play an even more dominant role. The paint, varnish, and lacquer manufacturers are constantly improving their products; new developments in application methods and metal preparation techniques, likewise, are being incorporated into plant production lines.

Now, the producer of electroplated finishes can look forward to an opportunity to increase the excellence of the plated finish, as government restrictions on metals for electroplating are modified. It may be quite a temptation for platers to conserve metal by applying thinner coatings than can be produced with the metal available. Experience has shown that such practice hurts the industry and the individual processor.

Now is the time to give the customer the best finish, either paint or plating, that his money can buy.

Ezra A. Blount

—EDITOR

Statistical Quality Control in the Finishing Industry

By BRYANT W. POCOCK, M.A.
Registered Professional Engineer

Statistical quality control may be defined as the application of a mathematical system to the efforts of any organized production group to maintain consistent, acceptable quality at the lowest possible cost. Wherever large numbers of similar units are manufactured, fabricated, or finished daily and held to certain tolerances of quality level, it is only by the application of this mathematical system that persons in responsible operational charge can be assured that they are in control of production quality.

The mathematical system need not be statistical in nature. Most of us, however, who are concerned with volume production become accustomed to dealing with large numbers. When we deal with large numbers of anything we usually find it more satisfactory to deal with them statistically.

For example, if we were required by specification to apply a dry film thickness of 1 to 1¼ mils of finish enamel to all front fenders passing through an enamel spray booth, we would be very much interested in knowing the average thickness of enamel on all fenders produced by a given shift. That number, the average, is nothing but a statistical number which can be used to represent

With this article, PRODUCTS FINISHING inaugurates a series of articles on the application of Statistical Quality Control to the finishing of metal products. Statistical Quality Control may be defined as a system by which rejects, and waste of process materials, can be cut to a minimum. Under today's conditions of higher prices and scarce materials, Statistical Quality Control opens one avenue toward the manufacture of higher quality products at lower cost. ***—The Editors.***

all the fenders finished during that shift. All of us are used to dealing with such a number. There is nothing new or frightening about it.

We might go even further than this, just to prove a point, and record the thickness of enamel on each fender. Not that we would wish to do this indefinitely, but it might be illuminating to do it for a single shift. If we plotted these thicknesses against the number of fenders for each thickness, we might obtain a curve such as that shown in Fig. 1. Such a curve is called a normal distribution curve, sometimes referred to as the Gaussian curve, because many naturally-occurring data throughout the world, when plotted this way, have been observed to produce the same curve. (Proof of this was offered on a strictly mathematical basis over a hundred years ago by Herschel in "Edinburgh Review," in connection with the mathematics involved in determining the probable error of dropping a cannonball on a desired target.) The vertical line through the center represents the average, which we shall assume in this case to be a thickness of 1.125 mils.

If we should take the difference between this average and the actual thickness for each fender, and square it, and then add all these squared deviations, then divide by the number of fenders, and finally take the square root of the result, we would get another statistical

BRYANT W. POCOCK, consulting and contributing editor of PRODUCTS FINISHING, is the author of a number of articles published in PRODUCTS FINISHING and other magazines describing various aspects of finishing and finishing installations.

His educational background includes an A.B. from John Hopkins University in 1927, M.A. from the University of Michigan in 1934, and two years of study (chemistry) at the Ludwig-Maximilians Universitat Munchen and the Privatlaboratorium Benders und Hobeins in Munich, Bavaria, Germany.

Mr. Pocock has been associated with the Michigan State Highway Department as chemical research engineer for a number of years. For one year he was director of research for the Keystone Asphalt Products Company, and for two years during World War II was chief chemist for the Nash-Kelvinator Corporation, Propller Division Plant No. 1, Lansing, Michigan.

Included in Mr. Pocock's scope of interests are memberships in the Lansing Engineers' Club, the Michigan Engineering Society, and the Royal Astronomical Society of Canada. He is a registered professional engineer in the State of Michigan.

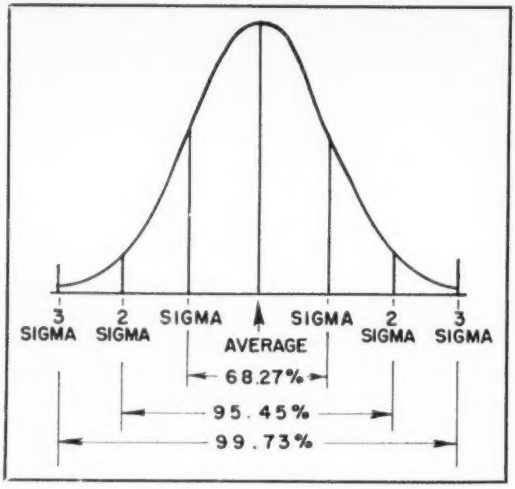


Fig 1—Normal or Gaussian Curve.

$$\delta = \sqrt{\frac{(X_1 - X)^2 + (X_2 - X)^2 \cdots + (X_N - X)^2}{N}}$$

number which we call the standard deviation.

Now, the interesting thing about the standard deviation, or sigma, (written δ), as it is also called, is that 99.73 per cent of the area under the curve will be found to lie between a point three times sigma to the left of the average, and another point three times sigma to the right of the average.

It has been found that 99.73 per cent of all the items in a normal distribution will fall between points, or levels, three standard deviations plus and minus from the average, or mean. A normal distribution can be assumed when the variations occurring in successive observations are due solely to a constant system of chance causes. This would be true, for example, of the lengths of the blades of grass on a front lawn. It would be true of the ages of all the people in any town. It should be equally true of the thicknesses of enamel on all the fenders which are inspected.

If this is so, then, why not set upper and lower control limits at three sigmas above and below the average? If everything is going along properly, one should expect that 99.73 per cent of the parts inspected would be within tolerance. Actually, this is exactly what is done in the majority of cases, although each individual item may not be plotted. Items are usually grouped, and their averages plotted. Sampling is carried out according to recognized tables, and a control chart is kept right on the machine, or spray booth, for the process which has to be controlled. Once points start appearing outside the control limits, it is a safe assumption that something has gone wrong. The attention of all concerned is thus directed to the fact that an unsatisfactory condition exists, and steps can be taken immediately to locate the difficulty and correct it.

So called three-sigma deviation is not the only type of control chart, and many variations of it are possible. Sometimes two-sigma deviation above and below the average is used as a warning signal, with three-sigma reserved for immediate action. These charts are commonly used in conjunction with range charts, which reflect process variability as compared with process level shown on the chart for averages.

Many specifications are based upon a minimum standard of acceptance; the unit is either acceptable or it must be rejected. Inasmuch as many finishing operations may be considered to

fall within this category, the go, no-go type of control chart will be discussed in some detail. This is the so called attributes measurements chart, or p bar (written $\bar{p}$) type of control chart, where $\bar{p}$ is the average fraction defective. If N is the number of items per sample, control limits may be set at plus and minus three times the square root of the fraction, $\bar{p}$ times the binomial (1 minus $\bar{p}$), divided by N[1].

[1] Upper Control Limit,

$$UCLp = \bar{p} + 3\sqrt{\frac{\bar{p}\,(1-\bar{p})}{N}}$$

Lower Control Limit,

$$LCLp = \bar{p} - 3\sqrt{\frac{\bar{p}\,(1-\bar{p})}{N}}$$

A range chart is not used in this case. This represents what is probably the simplest and most universally applicable kind of statistical quality control in existence.

From the standpoint of inspection, decision to accept a lot of material may be based upon per cent defective. Sampling tables are available on the market which will guarantee, on the average, practically any desired per cent of acceptable material on the basis of one or more crtical requirements. This type of statistical quality control is ideally suited to many phases of the finishing industry.

Table I.

ROCHELLE SALT COPPER CYANIDE, pH DETERMINATIONS
(Calculations Based on Individual Determinations)

X				X^2			
12.4	12.6	12.8	13.0	153.76	158.76	163.84	169.00
12.8	12.6	12.6	12.4	163.84	158.76	158.76	153.76
12.7	12.5	12.7	12.5	161.29	156.25	161.29	156.25
13.0	13.1	13.2	13.3	169.00	171.61	174.24	176.89
12.9	12.9	12.9	12.9	166.41	166.41	166.41	166.41
12.8	12.6	12.7	12.5	163.84	158.76	161.29	156.25
12.7	12.6	12.8	12.7	161.29	158.76	163.84	161.29
12.4	12.6	12.5	12.5	153.76	158.76	156.25	156.25
12.6	12.7	12.5	12.4	158.76	161.29	156.25	153.76
12.7	12.7	12.6	12.6	161.29	161.29	158.76	158.76
12.8	12.6	12.3	12.5	163.84	158.76	151.29	156.25
12.5	12.2	12.7	12.4	156.25	148.84	161.29	153.76
12.1	11.9	12.2	12.0	146.41	141.61	148.84	144.00
12.3	12.3	12.5	12.5	151.29	151.29	156.25	156.25
12.6	12.3	12.7	12.4	158.76	151.29	161.29	153.76
12.4	12.6	12.8	12.8	153.76	158.76	163.84	163.84

$\bar{X} = 12.60$ $\qquad \Sigma X^2 = 10{,}164.96$

$$\delta = \sqrt{\frac{10164.96}{64} - 158.76} = \sqrt{158.83 - 158.76} =$$

$$\sqrt{0.07} = 0.26457513. \qquad 3\,\delta = 0.79372539$$

Therefore $12.60 \pm 0.7937 = 11.81$ and 13.39.

Note: It can be proved mathematically that:

$$\delta = \sqrt{\frac{(X_1 - \bar{X})^2 + (X_2 - \bar{X})^2 \cdots (X_N - \bar{X})^2}{N}} = \sqrt{\frac{\Sigma\,(X - \bar{X})^2}{N}} = \sqrt{\frac{\Sigma X^2}{N} - \bar{X}^2}$$

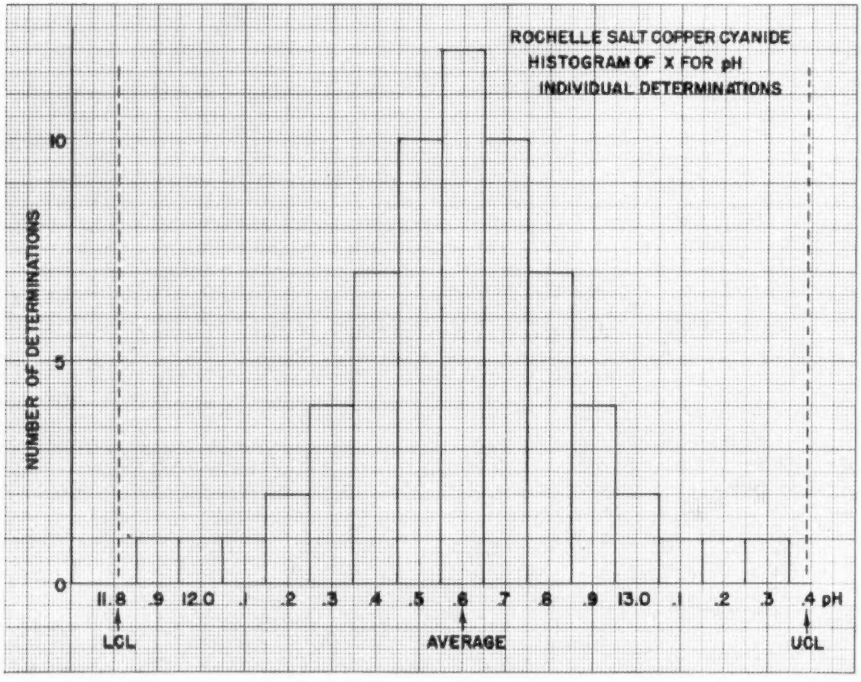
Practical Application of Statistical Quality Control

Examples may be cited to show how control charts work out in actual practice. Let it be assumed, for example, that a certain plant is engaged in copper plating, and that the Rochelle salt copper cyanide bath is used. This bath calls for a pH of 12.6 on the average, with limits between 12.2 and 12.8. It is considered desirable to investigate this property from the standpoint of statistical quality control, and to find out to what extent the pH of the bath fulfills the specification requirement during normal production, on the basis of S.Q.C. methods.

Accordingly, a procedure is worked out for the first and second shifts of a normal working day, whereby the pH of the bath is determined at intervals between the hours of 7:00 a.m. and 10:00 p.m. A total of 64 determinations of pH are made during this time, and they are recorded as shown in Table I. This table shows that the average, X-bar (written $\bar{X}$), equals 12.6 for 64 consecutive determinations of pH, which is just what it should be. The initial tendency is for everybody to feel happy about this, until it is noticed that the variation seems high.

After the results of the experiment have been plotted in the form of a histogram, as shown in Fig. 2, it is seen that the pH values extend from 11.9 to 13.3. The shape of the histogram is symmetrical about the average, 12.6, which is typical of normal distribution; so it is decided to go

Fig 2—Histogram showing graphically the pH determinations listed in Table I.



ahead and work out the standard deviation in order to see where the three-sigma upper and lower control limits fall. Included in Table I is the method used in calculating these values. It is seen that the control limits are 11.8 and 13.4. Assuredly, all values for pH fall within these limits; yet these limits, for this supposedly normal distribution, fall outside the specification limits (12.2 and 12.8). Moreover, so do a number of individual pH determinations. It would appear, then, that there must be something wrong with the specification. Perhaps it is too rigid. Perhaps the process capability is such that it is not possible to keep the pH between such close limits.

Just about this time, however, it is discovered that the chemist who made

Table II.

ROCHELLE SALT COPPER CYANIDE, pH OF BATH.

Time	X_1	X_2	X_3	X_4	$\bar{X}$	R
7	12.4	12.6	12.8	13.0	12.70	0.6
8	12.8	12.6	12.6	12.4	12.60	0.4
9	12.7	12.5	12.7	12.5	12.60	0.2
10	13.0	13.1	13.2	13.3	13.15	0.3
11	12.9	12.9	12.9	12.9	12.90	0.0
12	12.8	12.6	12.7	12.5	12.65	0.3
1	12.7	12.6	12.8	12.7	12.70	0.2
2	12.4	12.6	12.5	12.5	12.50	0.2
		Change of Shift				
3	12.6	12.7	12.5	12.4	12.55	0.3
4	12.7	12.7	12.6	12.6	12.65	0.1
5	12.8	12.6	12.3	12.5	12.55	0.5
6	12.5	12.2	12.7	12.4	12.45	0.5
7	12.1	11.9	12.2	12.0	12.05	0.3
8	12.3	12.3	12.5	12.5	12.40	0.2
9	12.6	12.3	12.7	12.4	12.50	0.4
10	12.4	12.6	12.8	12.8	12.65	0.4
(N equals 16)				$\bar{\bar{X}}$ equals	12.60	0.3062 equals $\bar{R}$

Control limits for the charts are found as follows:

$$\bar{\bar{X}} + A_2\bar{R} = UCL;\ 12.60 + 0.729 \times 0.3062 = 12.8232$$

$$\bar{\bar{X}} - A_2\bar{R} = LCL;\ 12.60 - 0.729 \times 0.3062 = 12.3762$$

$$D_4\bar{R} = UCL;\ 2.82 \times 0.3062 = 0.6987$$

$$D_3\bar{R} = LCL;\quad 0 \times 0.3062 = 0$$

Double X bar ($\bar{\bar{X}}$) and R bar ($\bar{R}$) are the grand average of the samples and range average respectively; A_2, D_4, and D_3 are constants used to obtain plus or minus three-sigma control limits of expected variation for a sample size. They are selected from standard tables.

$A_2\bar{R}$ is the distance above and below the grand average ($\bar{\bar{X}}$), within which averages of samples for a controlled process should occur; that is, approximately 99.7 per cent of the measurements will fall in these limits. $D_3\bar{R}$ and $D_4\bar{R}$ are the lower and upper limits of variation for the range of samples.

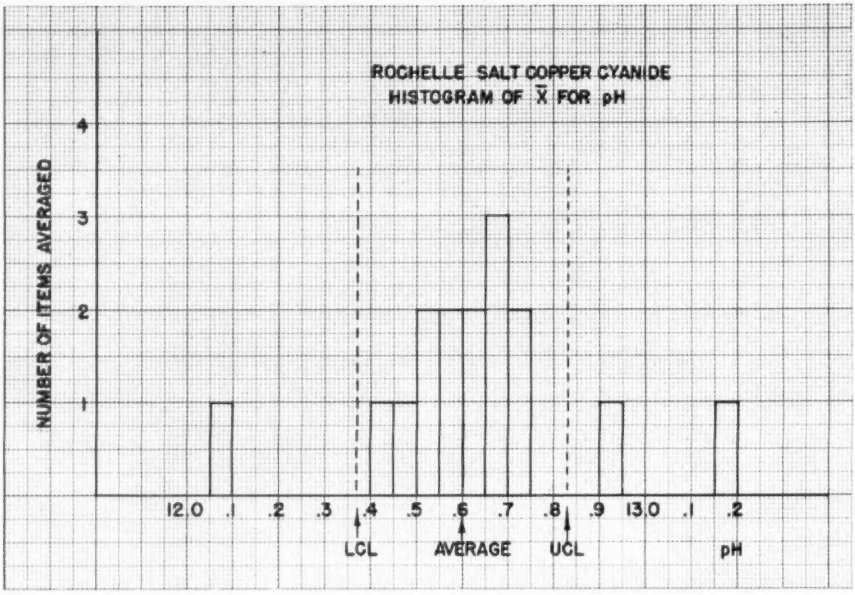


Fig. 3—Histogram showing graphically the pH determinations listed in Table II.

the determinations during the first shift had arbitrarily decided to take four samples at 7:00 o'clock, four more at 8:00 o'clock, and so on, four each hour on the hour, as a most convenient method of securing the requested data; and that moreover he had advised the chemist who succeeded him on the second shift of what he had done, and instructed him to do the same thing. This made a great difference.

In Table II the same determinations are listed over again, just as the chemists reported them, this time arranged with deference to the grouping in which the samples were taken. The standard, recognized A.S.T.M. treatment of this information (small samples of equal size) is now applied, as shown in Table II, and it is seen at a glance that the results are far different. The grand average,[2] now called X-double bar (written $\bar{\bar{X}}$), is still 12.6, but this time account is taken of the variation within the samples taken at the same times. Now, the control limits turn out to be 12.4 and 12.8.

When the data are plotted in the form of a histogram, as in Fig. 3, it is seen that they are not symmetrical about the mean of 12.6, and that the distribution is far from normal. So a control chart is drawn up, as shown in Fig. 4. This figure illustrates graphically the fact that, so far as pH is concerned, the process was definitely out of control at 10:00 a.m., 11:00 a.m., and again at 7:00 p.m. There is nothing the matter with the original specification, apparently, as even with abnormal distribution shown by the histogram and with three points out of control, the three-sigma limits do not lie outside the specification limits. The range-chart (Fig. 4, bottom), along with the chart for averages may be

[2] By this method, $\bar{X}$ is the average of the four readings taken at the same time.

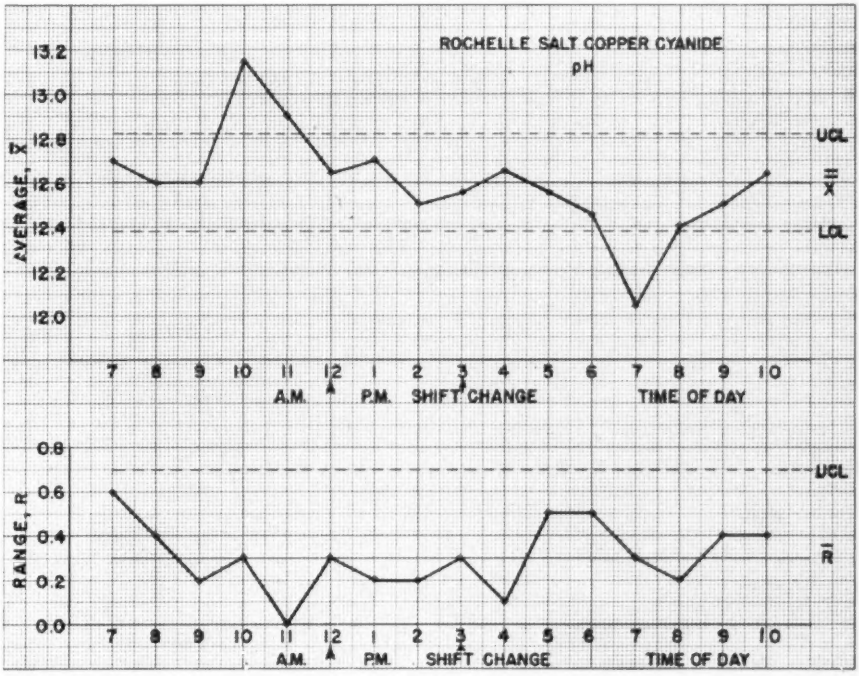
used to substantiate the evidence disclosed by the latter that three points are definitely out of control.

The question of what to do about it resolves itself into one of initiating another investigation, this time of an engineering nature. It now becomes necessary to find out what caused the process to go out of control at the times indicated by the charts. Such causes are definitely assignable causes; that is, they are not random, or of the type that cannot be found. There must be definite reasons why the process went out of control, and it is up to the engineer in charge to find them. That is the value of control charts. They point an accusing finger at an operation at a time when it is still possible to do something about it in order to avoid future loss. It would appear from the above data that finding the causes for departure from control would not be difficult.

Another type of control chart of great value in finishing is illustrated in Fig. 5. This is the chart for fraction defective, or p chart. A variation of this, shown in the same figure, is the chart for number defective, or pn chart. Data used in plotting both of these charts may be seen in Table III.

Let us assume that a hypothetical plating concern is faced with the prospect of establishing a working tolerance on the per cent or number of defective pieces, in this case automobile molding rails, or trim, which can economically be allowed to appear in each batch of 500 pieces. The first thing

Fig. 4—Control chart (above) for pH determinations listed in Table II. (Below) range chart plotting data listed in Table II.



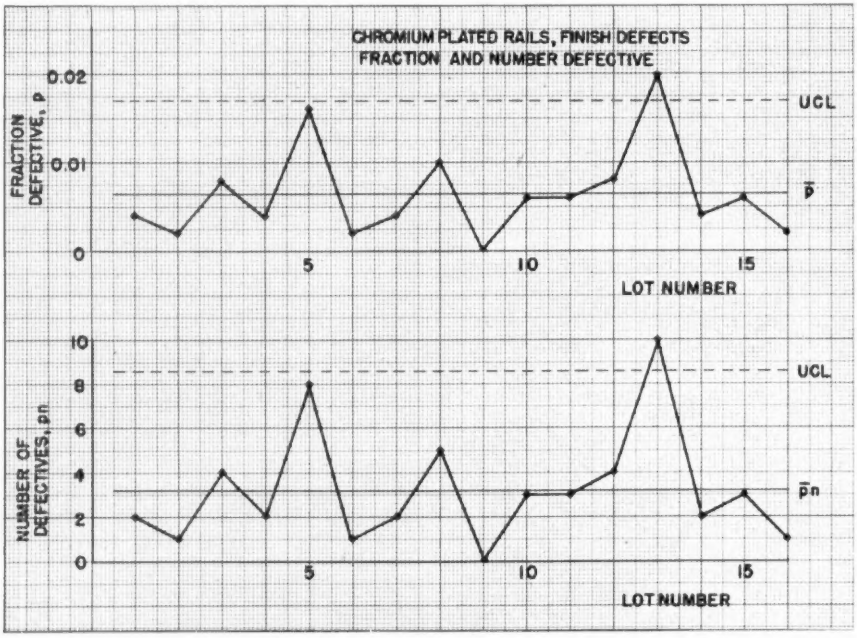
that should be done is to see how things are at the present time—to find out the per cent of defectives now being manufactured, and to determine at once whether the process is at a reasonable level and under statistical control. A series of 16 batches is therefore selected at random, and the number and per cent of defective pieces in each batch is determined by inspection.

The p and pn charts shown in Fig. 5 indicate a rather low level of parts defective for this operation, with batch No. 13 the only one of 16 batches out of control. This batch will have to be one hundred per cent inspected, assuming that originally all batches were inspected by sampling methods. Knowing the present process level, the engineer can determine what further steps are possible with a view toward lowering the upper control limit.

This brings up again the question of sampling methods. These are techniques worked out on the basis of the mathematical theory of probability, which enable the operator to arrive at a representative sample without having to resort to one hundred per cent inspection. The methods whereby this is accomplished are presented in any recognized text on statistical quality control, and are beyond the scope of this article. Representative texts are listed near the end of this article.

It is of course paramount that application of the methods of statistical quality control should be reflected in lowered costs. At the Lundberg Manufacturing Company, Lansing, Michigan, estimates place cost reduction at a minimum of 20 per cent since S.Q.C. was adopted. Lloyd Cook, assistant chief inspector at Reo Motors, Inc.,

Fig. 5—Chart showing number of defective parts and fraction defective in lots of chromium plated rails, based on data outlined in Table III.



places Reo's savings at from 5 to 10 per cent. Such estimates presuppose, however, that S.Q.C. is maintained under a definite, constant program, with full cooperation and confidence of all personnel concerned.

Bob Muir of the Lundberg Company expresses it this way: "Success will hinge upon setting up cut-and-tried rules and instructions. Decisions of how to check this or that cannot be left to the discretion of the inspector, because one man will do one thing one way, and somebody else will come along and do something else another way. A layout instruction card should

Table III.

CHROMIUM PLATED RAILS, FINISH DEFECTS

Lot No.	Sample Size, n	Number of Defectives, pn	Fraction Defective, p
1	500	2	0.004
2	500	1	0.002
3	500	4	0.008
4	500	2	0.004
5	500	8	0.016
6	500	1	0.002
7	500	2	0.004
8	500	5	0.010
9	500	0	0.000
10	500	3	0.006
11	500	3	0.006
12	500	4	0.008
13	500	10	0.020
14	500	2	0.004
15	500	3	0.006
16	500	1	0.002
Total	8000	51	0.102

Calculations:

1. For p:

Central line: $\bar{p} = \frac{51}{8000} = 0.0064$

Control limits ($n = 500$): $\bar{p} \pm 3\sqrt{\frac{\bar{p}(1-\bar{p})}{n}} = 0.0064 \pm 3\sqrt{\frac{0.0064\ (0.9936)}{500}} = 0.0171$ and 0.

2. For pn:

Central line: $\overline{pn} = \frac{51}{16} = 3.1875.$

Control limits: ($n = 500$) $\overline{pn} \pm 3\sqrt{\overline{pn}} = 3.1875 \pm 3\sqrt{3.1875} = 8.544$ and 0.

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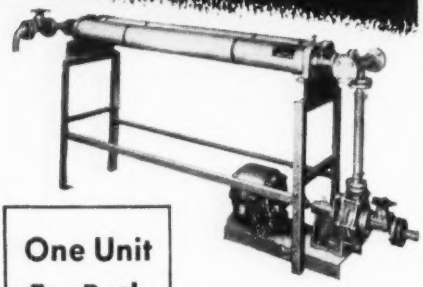

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be set up for first piece inspection. Positive instructions should be given on a card for each part, to which the inspector must refer. Nothing should be left to the human element."

The same thought is expressed in a different way by Reo's chief inspector, Monte Murray: "S.Q.C. by itself won't cure anything. It'll put the finger on the trouble, then somebody's got to move. And move fast, if they're going to gain anything by it. We can chart every job in this plant; but if production doesn't step right up the minute that our charts show that the product is out of control, and do something about it, then it's love's labor lost. There's no point in it." Reo is now operating on the basis of standard sequential sampling plans, using government tables.

Concerning them, Mr. Cook has this to say: "The tables themselves are self-explanatory. They tell exactly when to accept and when to reject. Any quality control book, if it's authoritative, will state that a sequential sampling plan will give whatever quality level is wanted, at whatever percentage is desired. To be representative of the lot, however, the samples must be random samples."

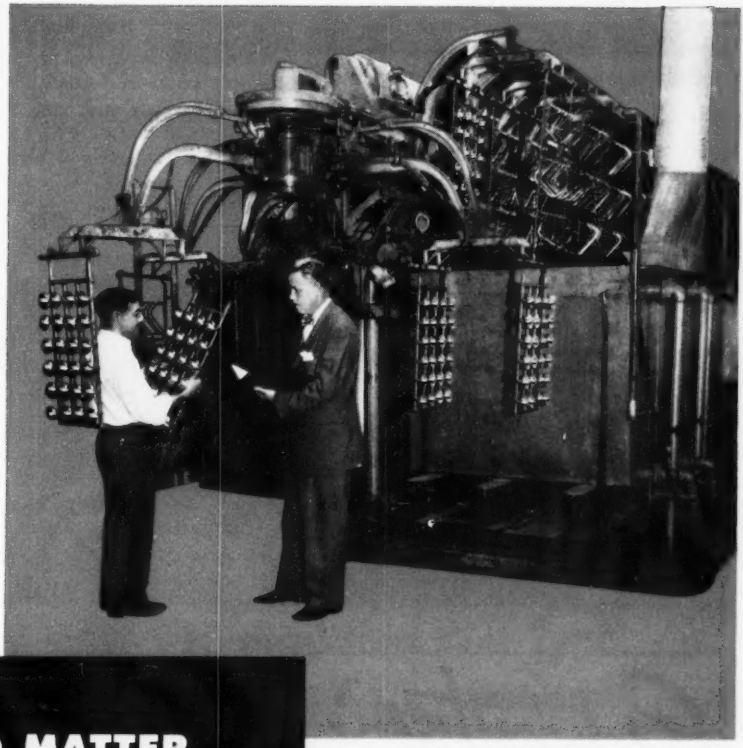
Attention is called to the highly useful tables contained in the "A.S.T.M. Manual on Presentation of Data," American Society for Testing Materials, Philadelphia, Pennsylvania. The following texts are also recommended:

"Quality Control—Principles, Practice, and Administration," A. V. Feigenbaum; McGraw-Hill, 1951.

"Statistical Quality Control," E. L. Grant; McGraw-Hill, 1946.

"Quality Control and Statistical Methods," E. M. Schrock; Reinhold, 1950.

"Quality Control—Manual of Practical Procedure for Shop and Plant Operation," N. L. Enrick; The Industrial Press, 1948.



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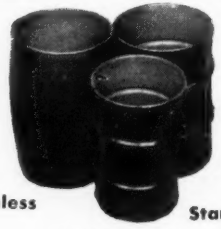

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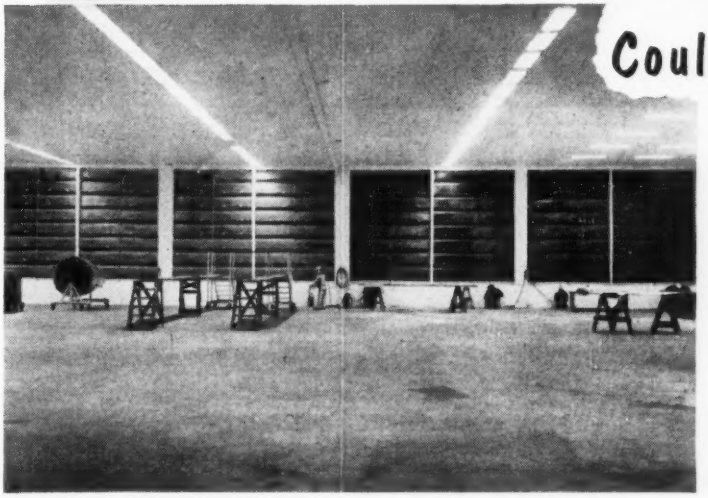

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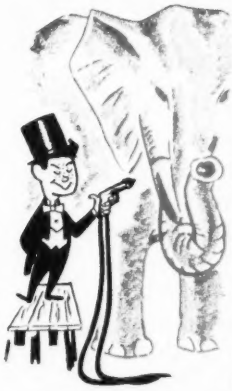
Hydro-Whirl Wet Type Paint Spray Booth



Comparisons are not always favorable but here's one that is emphatic—the relative size of the man in the photo's center emphasizes the immensity of this Peters-Dalton Hydro-Whirl Spray Booth installation in a major aircraft plant. True, not many paint problems require booths of this size — yet this one, like innumerable others, is best served by a Hydro-Whirl Wet Type Paint Spray Booth. Their extremely high air washing efficiency and relatively lower maintenance cost has established Hydro-Whirl Wet Type Booths as superior for paint application while maintaining ideal working conditions.

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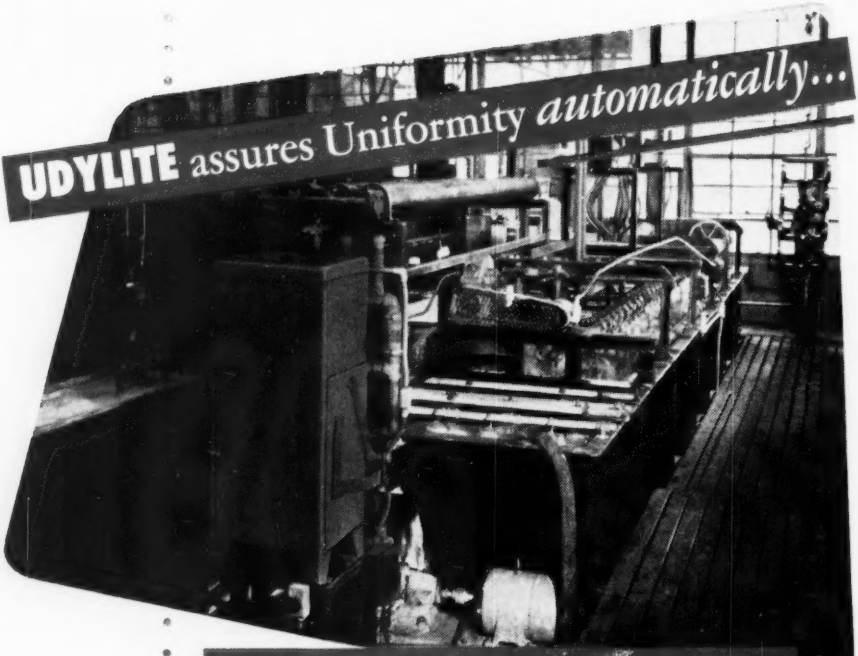

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Comments on the

By JOHN STARR

ALTHOUGH many problems remain to be solved, evidence to date provided by the western aircraft industry clearly indicates that titanium can be finished as satisfactorily in most respects as more conventional materials.

Titanium is a metallic element of particular importance to the aircraft industry at this writing because it is almost as light as aluminum, yet comparable to stainless steel in terms of mechanical strength. Moreover, it seems destined to become a material with many applications in virtually all industries because: it is the fourth most abundant structural metal in the crust of the earth; for the first time since it was identified as a chemical element more than 50 years ago, titanium is now being extracted from ore at commercially feasible prices.

Finishing techniques are highly essential to the successful use of titanium because the latter has an unusual tendency to oxidize. On the other hand, it is the tendency of titanium to oxidize that makes the subject finishing operations difficult in most respects.

For example, most efforts to electroplate titanium are believed to have been unsuccessful because it is difficult to get the metal into a plating bath with the oxide-free surfaces that are essential to the adhesion of the deposit. However, titanium stock materials are now being copper plated satisfactorily enough to reduce galling as they are fabricated, and laboratory tests have shown that titanium parts can be adequately plated with other metals, if they are cleaned with sufficient care.

Both chemical and mechanical methods have been used in cleaning titanium. Mechanical techniques are of course preferable where heavy deposits of scale must be removed; but, since this normally involves the use of grit or vapor blasting equipment, the use of chemical cleaners is usually specified if maximum surface smoothness must be maintained (see Fig. 1).

Foreign matter such as dirt, oil, and grease can be removed from titanium surfaces in a conventional manner with common commercial solvents or detergents. However, the complete removal of oxides necessitates the use of special acid or caustic solutions.

One of the best methods of removing heavy scale formations at this writing involves the immersion of titanium parts in a caustic bath, heated to about 800 deg. F. This is usually followed by a water quench and a quick dip in a brightening solution which comprises 2 per cent hydrofluoric acid and 10 per cent nitric acid by volume. The brightening solution alone is generally sufficient for the removal of oxide deposits which cause the metal to be only slightly discolored.

Some embrittlement can be caused where sodium hydride or caustic soda solutions alone are used to descale thin

FINISHING of TITANIUM

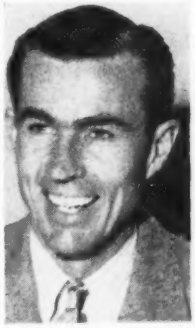
titanium sheet materials, but this can usually be avoided by proper process sequence.

For many low temperature applications, titanium materials or parts can be anodized in a chromic or sulfuric acid bath and then dyed or organically finished—much the same as aluminum is processed (see Fig. 2). However, many of the most practical uses for titanium at present require extreme chemical inertness at elevated temperatures.

Titanium has a very high melting point (3,140 deg. F.). However, it will oxidize with exceptional speed if its surfaces are exposed to ordinary air at temperatures exceeding 800 deg. F. Therefore, titanium parts for elevated-temperature applications must be protected with metallic or ceramic coatings of some kind.

In the latter connection, the commercial significance of electroplating techniques remains to be demonstrated. Similarly, while sprayed metal coatings can be satisfactorily anchored to titanium parts that have been properly roughened and machined, there is no reason to believe that a pneumatically applied metal finish can have the purity and low porosity that is necessary to prevent the oxidation of titanium at elevated temperatures.

However, titanium has been satisfactorily metallized with evaporation coating equipment. Evaporation coating is the process whereby air is evacuated from a vacuum chamber so as to permit the substitution of an inert gas such as argon or helium and thus to prevent oxidation as a deposition material is heat-vaporized with electrical current. Heat-vaporization causes an inert coating material—such as aluminum, gold, or tungsten—to be smoothly deposited on a titanium deposition surface, much the same as steam from hot water may be deposited on a windowpane, regardless of whether the finishing material is



JOHN STARR, after graduating from the California Institute of Technology in 1936, launched his career with the Lockheed Aircraft Corporation in Burbank, California. He joined the Ford Motor Company's Long Beach plant in 1939 and remained there until 1942 when he became a Lieutenant in the U. S. Navy.

In 1946, Mr. Starr joined Research Associates of California as a process engineer. There, he has devoted his time to the development of specialized finishing techniques for manufacturers.

Fig. 1 — Special acid and caustic solutions are used where it is necessary to clean titanium parts chemically.

electrochemically compatible with titanium.

Both metallic and non-metallic coatings can be built up on titanium parts in layers with thicknesses ranging upward from a millionth of an inch, simply by limiting the amount of time during which evaporation takes place in each case. Little or no heat is conveyed to the deposition surfaces because the coating particles are of molecular dimensions and subject to rapid chilling.

Metallic evaporation coatings resemble electroplated coatings, although they do not require the buffing or polishing that is necessary to produce maximum brightness in electroplated coatings; and, because of their extremely low porosity, they can be applied in extremely thin layers which will protect titanium adequately without reducing the flexibility of the thinnest sheet stampings.

As yet, evaporation coatings are not being applied as extensively as might be expected because of high costs. Such costs are not great if computed on a day-by-day production basis over a long period of time, but evaporation coating equipment does necessitate an initial investment that tends to discourage many prospective users.

Therefore, many firms such as Solar Aircraft Company of San Diego, Calif., have been concentrating on the devel-

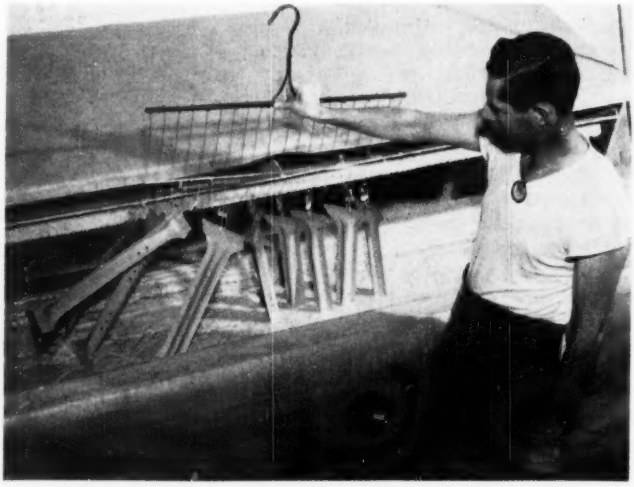


Fig. 2—Titanium aircraft parts are anodized and organically finished much the same as standard aluminum parts.
(Photo courtesy Consolidated Vultee Aircraft Corp., San Diego, Calif.)

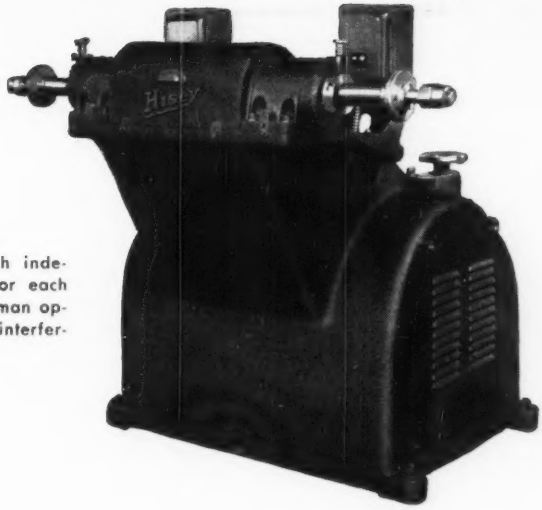


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Fig. 3—Conventional pneumatic spray equipment can be used as illustrated here to finish anodized titanium parts which require no great heat resistance. *(Photo courtesy Consolidated Vultee Aircraft Corp., San Diego, Calif.)*

opment of ceramic coatings which can be applied to titanium parts the way porcelain enamels are applied to certain iron and steel products. Such coatings have been used with some degree of success on ferrous alloys containing titanium, and can probably be applied to some of the heavier titanium alloys. However, experienced engineers candidly admit that—barring some revolutionary new development—pure and almost-pure titanium materials cannot be satisfactorily finished with ceramics because of the oxidation that takes place when a non-metal is fused into a titanium surface.

In theory, it is possible to minimize the latter oxidation by using ceramic materials dispersed in a medium other than water and by firing the applied materials in an inert gaseous atmosphere. But that would probably exceed the cost of the aforementioned evaporation process, which already serves the same general purpose.

SLAB ZINC CONSUMPTION. In 1952 United States smelters produced 961,200 tons of slab zinc, about 3 per cent more than in the previous year and not far short of equaling the all-time record reached in 1943, it has been reported in "A Review of The Zinc Industry in 1952," by Ernest V. Gent, executive vice president of the American Zinc Institute, Incorporated.

Slab zinc consumed in the United States (U. S. Bureau of Mines data) was divided into use categories as follows:

	1951	(Jan.-Oct) 1952	
Galvanizing	400 279	302 513	tons
Brass Products	143,292	124,323	"
Zinc-base Alloys	296,434	189,383	"
Rolled Zinc	64,085	42,437	"
Zinc Oxide (French Proc.)	18,223		"
Other	11,658	24,581	"

Lucoflex Ventilating Fan

The Bureau of Mines Yearbooks report that the zinc content of zinc oxide and lithopone produced in the United States from both domestic and foreign ore was 131,184 tons in 1951. The tonnage in 1952 has not yet been determined but probably will approximate the 1951 figure.

1952 Nickel Production

It is estimated that the free world output of nickel in 1952 exceeded 315,000,000 pounds, compared with 295,000,000 pounds in 1951. Canadian production amounted to approximately 280,000,000 pounds, or about 90 per cent of the total.

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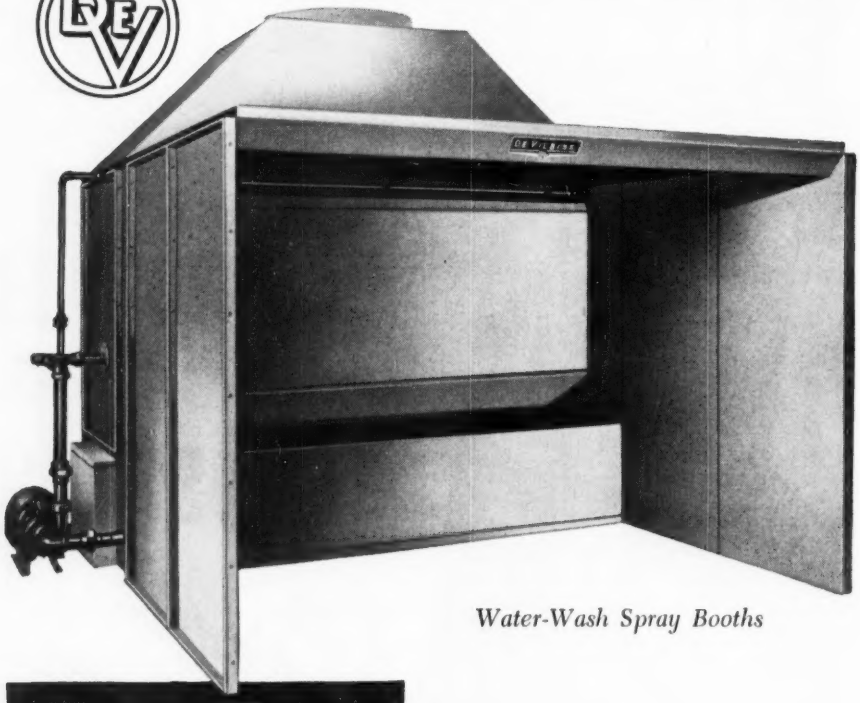

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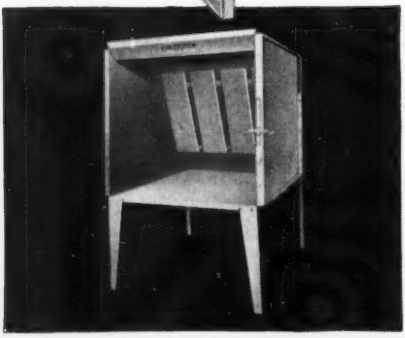

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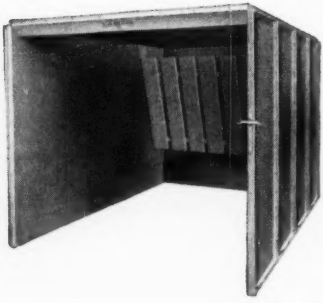

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Easy to convert to meet future needs – panel type construction makes it convenient to move, enlarge, rearrange or revamp.

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Spotlighting FINISHING Progress

How To Select A Surface Active Agent For Use In Metal Cleaning

By DR. ALLEN G. GRAY

THE selection of surface active agents (surfactants) for specific metal cleaning applications is usually made on a trial and error basis using laboratory detergency tests that have been correlated with field test results. The time consuming, trial and error approach, according to A. M. Mankowich, Paint and Chemical Laboratory, Aberdeen Proving Grounds, is not the preferred procedure for determining the suitability of various surfactants for use in cleaning compounds intended for the removal of specific soils from specific substrata.

In "Industrial and Engineering Chemistry," Mankowich pointed out that the selection of surfactants for specific detergent applications can be accomplished more scientifically and economically by determining the fundamental or prime factors in the detergency process; then studying each factor to establish numerical criteria for the various types of surfactants and builders under varying pH, concentration, and temperature conditions. Soils should be classified with reference to the numerical values of the prime factors, and cofactors, namely, the minimum numerical criteria for each prime factor necessary to accomplish soil removal in specific soil-surface combinations

A Monthly Digest of Current Technical Progress Indicating Significant Trends and Developments in the Finishing Industry

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: RUST PROOFING WITH PERMADINE®

INTRODUCTION:

Rust proof coatings find many practical applications. During World Wars I and II most small arms were rust proofed by zinc phosphate coating, impregnating with chromic acid and finishing with a rust-preventive oil, or cutback petrolatum. This not only provided excellent corrosion resistance but also yielded a dull black non-reflecting surface.

Ferrous metal parts that have been Permadized in a zinc phosphate chemical solution and then "sealed" with a rust-preventive oil such as "Granoleum" are effectively protected from rust-damage. In addition, if the surface is accidentally chipped or scratched, rusting is confined to the exposed area.

PERMADIZING:

For the most effective rust proofing of large or small work in large or small production, "Permadine" is used in tanks in an immersion process. The coated parts are rinsed in clean water, and then in a controlled dilute acidulated solution. After drying, a suitable corrosion-resistant oil such as "Granoleum" is applied.

Operations can be carried out with the work in crates or hung from hooks, utilizing an overhead rail and hoists. For large volume production, automatic equipment can be used to mechanize the line. Small parts can be treated in tumbling barrels.

"PERMADINE" DATA CHART

Type of coating	Zinc phosphate
Object of coating	Rust and corrosion prevention
Typical products treated	Nuts, bolts, screws, hardware items, tools, guns, cartridge clips, fire control instruments, metallic belt links, steel aircraft parts, certain steel projectiles and many other components
Scale of production	Large or small volume; large or small work
Method of application	Dip, or barrel tumbling
Equipment notes	Immersion tanks of suitable capacity. Cleaning and rinsing stages can be of mild steel. Coating stage can be of heavy mild steel or stainless steel.
Chemicals required	"Permadine" No. 1
Pre-cleaning methods	Any common degreasing method can be used. Alkali cleaning ("Ridosol"), Acid cleaning ("Deoxidine"), Emulsion-alkali cleaning ("Ridosol"-"Ridoline"); vapor degreasing, solvent wiping, etc., are examples.
Bath Temperature	190° - 210°F.
Coating time	20 - 30 minutes
Coating weight range Mgs./Sq. Ft.	1000 - 4000
Government Finish Specifications	U.S.A. 57-0-2C; Type II, Class B MIL-C-16232; Type II.

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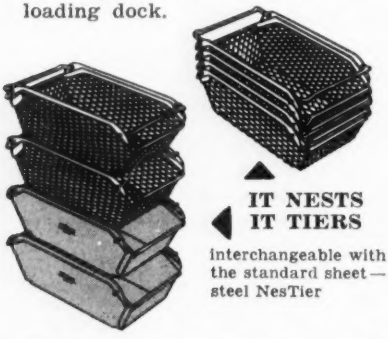

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Now small parts may be routed through every plant operation without changing containers. NesTier baskets serve as flexible stockroom fixtures, may be transported tiered or nested on pallets, are adaptable to roller or overhead conveyors or may be carried easily by hand. Require a minimum of storage space.

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should be determined.

Once the prime factors for various types of surfactants and the cofactors for the soils are determined, an inspetion of the data will indicate appropriate surfactants or combinations of surfactants, aswell as suitable temperature, pH, concentration, and builder data. This is done by selecting the surfactant, or combination of surfactants, whose prime factors have equal or greater numerical ratings than the corresponding cofactors. The principle advanced is that detergency in a specific soil-surface application is accomplished only if the numerical ratings of all the cofactors are equaled or exceeded by the prime factors of the cleaning solution. An advantage of the proposed method of selection is that it will indicate a number of surfactants or combinations of surfactants for each soil-surface application, thus permitting a final selection on an economic basis.

Present day knowledge indicates that detergency is the resultant of many factors. Attempts to correlate detergency with one factor only have been unsuccessful. Detergency is dependent on three groups of variables: those originating in the soil, in the surfactant, and in the surface. Thus, a factor involving only one of the groups, such as surface tension, or two of the groups, such as micellar solubilization, is basically not in coorelation with detergency.

What Constitutes Detergency

Mankowich pointed out that one authority considers detergency to be due to the prime factors of suspendibility, protective power, micellar solubilization, and ion exchange, although all these characteristics need not be possessed by all detergents. It is noteworthy that wetting power is not included. However, since both preferen-

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tial wetting and ion exchange imply adsorption phenomena, it is possible that ion exchange data will permit estimation of wetting power or that it may even be a more fundamental characteristic than wetting power, to which it is related.

Another viewpoint is that preferential wetting is the prime factor in detergency, with surface tension and interfacial tension (soil-surfactant) as minor factors. Another investigator gives preferential wetting as the chief action, and interfacial tension (soil-surfactant), emulsification and micellar solubilization as minor factors. Still another viewpoint proposes that the mechanism of detergency involves the factors of adsorption, capillary penetration, and emulsification. Snell[1] states that preferential wetting, deflocculation, and emulsification are the chief factors.

Mankowich suggested tests for studying suspending power and micellar solubilization of surfactants. Suspension tests were made using manganese dioxide and carbon powder. The test used for evaluating the various surface active agents was based on the ordinary pipet method for sedimentation, modified to include the advantages of the Andreasen sedimentation apparatus. The settling period was two hours. Micellar solubilization was investigated by determining solubilization values for certain dyestuffs at definite surfactant concentrations.

* * *

Plating With the Platinum Group Metals

THE platinum group comprises six metals, all of which are inert, stable, tarnish resistant, corrosion resistant and generally white in color. Of the six metals in the group, only platinum, palladium, and rhodium have found practical applications in electroplating. A steadily increasing demand for white, reflective, and tarnish resistant finishes has stimulated the development of improved plating processes for these metals.

Rhodium

Because of its whiteness, hardness, high reflectivity and corrosion resistance, rhodium makes an ideal electroplate for many special applications. Its most important uses are in the optical, jewelry, and electrical fields, where its high reflectivity, hardness and chemical stability make it particularly desirable. Table I compares the reflectivity of rhodium with that of certain other metals. The only metals used for reflecting surfaces which have a reflectivity higher than that of rhodium are freshly polished silver and

[1] F. D. Snell, Ind. Eng. Chem., *24*, 76 (1932).

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Table I

APPROXIMATE REFLECTIVITY OF CERTAIN METALS

Silver (freshly polished)	94%*	Nickel	67%*
Aluminum	90%	Chromium	67%*
Rhodium	76%*	Platinum	65%
Iridium	70%	Palladium	63%

* Determined by the National Bureau of Standards

(Courtesy Sigmund Cohn Mfg. Co.)

aluminum, which however lose their high reflectivity after exposure to the atmosphere, and drop to values lower than shown on the table.

Rhodium is reported to be harder than any of the other metals shown in Table I with the exception of chromium, the reflectivity of which is much lower than rhodium. This makes rhodium very desirable for a reflecting surface since it combines hardness with high reflectivity and can frequently be cleaned by wiping, if necessary, without danger of scratching. The nickel-copper electroformed searchlight reflector shown in Fig. 1 has been given a rhodium plate on the reflecting surface.

Rhodium electrodeposits up to about 2 or 3 mg./sq. ft. are bright and are suitable for searchlight reflectors, jewelry and ornamental work, wave guides, and other applications where the desired characteristics are corrosion resistance, color, good electrical conductivity and high reflectivity. Deposits in excess of this amount become frosty in appearance and although their corrosion resistance, as reported, is not much higher than the thinner deposits, they are very useful for sliding or wiping electrical contacts, where light contact pressures and low contact resistance are required.

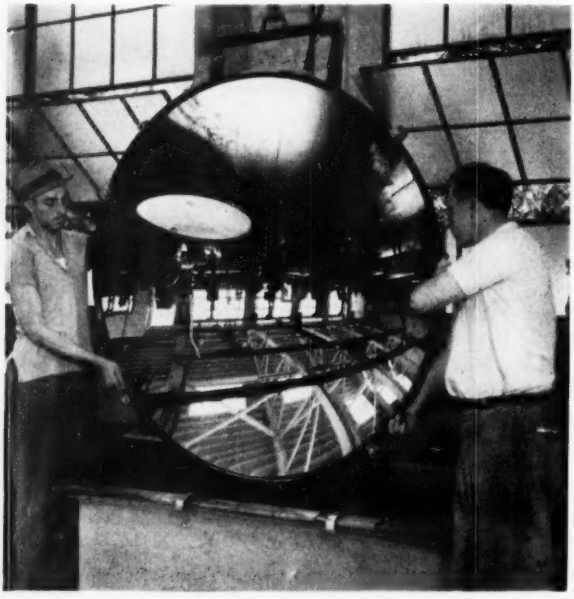

Fig. 1—In electroforming this searchlight reflector, nickel is plated on a master mold of glass which has been given a conductive film of silver. Copper is then plated on the nickel to form the reflector that results when the combined deposit is stripped from the mold. The reflecting surface is given a flash rhodium plate.

(Photo courtesy Bart Laboratories, Belleville, N. J.)

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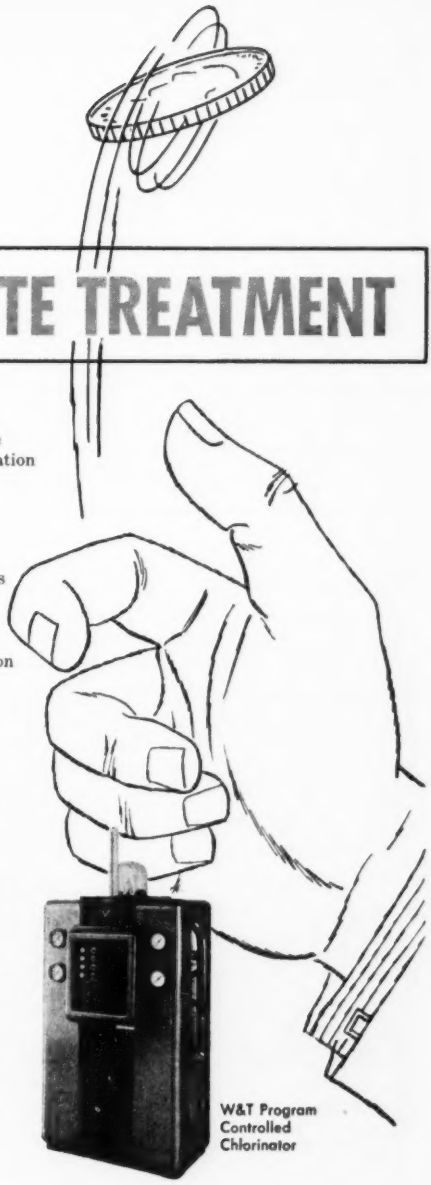

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Table II.

RHODIUM PLATING BATHS

CONSTITUENT	CONCENTRATION
(I) Sulfuric acid (Conc. C.P.)	20 cc./l. (2.523 liquid oz./gal.)
Rhodium metal in prepared conc. solution	2 g./l. (5 dwt./gal.)
(II) Orthophosphoric acid (85%)	40 cc. /l. (5 to 6 liquid oz./gal.)
Rhodium metal in prepared conc. solution	2 g./l. (5 dwt./gal.)

(Based on data from Baker and Co., Inc.)

Rhodium Plating Baths

Two general types of rhodium plating baths are used in which rhodium is present either as phosphate or sulfate; a special bath is sometimes used in which the metal is present as a combination of the two acids. The metal content of the rhodium sulfate or rhodium phosphate bath is usually around 2 g./L. (5 dwt./gal.). The acid concentration is not very critical and can range from 10 cc./L. upward for either sulfuric acid or phosphoric acid. Higher acid concentration tends to lower the cathode efficiency slightly.

Representative compositions for rhodium sulfate and phosphate plating baths are given in Table II. It is important in making up either bath to add the acid to the water before adding the rhodium. If this is not done, the rhodium compound may be partially precipitated by hydrolysis. The best working temperature is around 110 to 125 deg. F. A current density of from 10 to 100 amp./sq. ft. may be used. Insoluble platinum anodes are used, and the metal content is replenished by the addition of the concentrated rhodium solution. A satisfactory rhodium solution of this type should produce a bright deposit of approximately 0.00006 inch in 30 minutes at 20 amp./sq. ft. Deposits so produced do not require buffing, and the throwing power approaches that of a gold or silver cyanide plating bath.

Heavy rhodium deposits (up to 0.0005 inch thickness) found limited application during World War II where highest wear and corrosion resistance were required. A bath consisting of 10-20 g./L. of rhodium metal as rhodium phosphate and 20 cc./L. of concentrated sulfuric acid has been recommended for producing heavy deposits. A current density of 5 amp./sq. ft. or less should be used at a bath temperature of around 120 deg. F.

It has become common practice to

to page 58 →

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use a nickel or bright nickel undercoat for rhodium, except in the case of gold alloys and platinum bases. Zinc, tin and lead alloys must receive a heavy nickel undercoat to completely protect the metal from the action of the acid rhodium plating solution. All basis metals, as well as silver, should receive an underplate of nickel. Soft metals, such as the tin alloys, should be copper flashed prior to nickel plating. After nickel plating and a very thorough rinsing, the work should be rhodium plated without delay.

One point to be kept in mind is that imperfections and flaws in the basis metal are not covered by plating. Instead, they are emphasized and will show up more conspicuously after rhodium plating. For this reason, all work to be rhodium plated should be given a "perfect" finish. After polishing it is desirable that the bulk of the polishing compound be removed by vapor degreasing or treatment in an emulsion cleaner. The articles are then rinsed, preferably in hot water, and placed on racks for cleaning and plating.

A commercial electrocleaner, maintained at 200 deg. F., may be used for further cleaning prior to plating. A solution of 4 to 6 oz./gal. of trisodium phosphate is also a satisfactory cleaner. Cathodic cleaning at 6 to 8 volts for about one minute is generally satisfactory. The electrocleaning should be followed by several rinses in running water. This should be followed by a dip in 10 per cent potassium or sodium cyanide solution, followed by a very thorough water rinse. A dip in 10 per cent hydrochloric or sulfuric acid, and a final rinse concludes the preparatory cycle before the actual plating.

For general work with conspicuous polished areas, the lower current density ranges are recommended for rhodium plating in order to avoid burning or cloudiness. For fine chains or simi-

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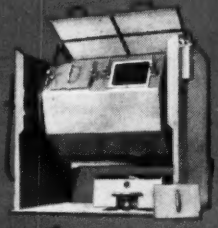

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lar work a high current density will generally give better results. Considering the slow rate of deposition of rhodium, one minute is considered a minimum for bringing out the true rhodium color.

Platinum Plating Baths

Since platinum deposits are used mostly for ornamental purposes and as flash plates, for reasons of economy, it has become common practice to use a nickel undercoat. This is necessary whenever lead, tin, zinc alloy articles are to be plated. When heavier than flash deposits of platinum are applied, they must be scratch brushed intermittently.

The oldest and most widely used platinum plating solution is based on a chloro-platinic acid solution. A solution of this type recommended for flash plating has the folowing[1] composition:

sity of 5 to 10 amp./sq. ft. Bright flash deposits can be obtained in 30 to 120 seconds; after that the deposit turns cloudy and finally dull gray.

Another type of plating bath, based on the same formula as given above, uses platinum diaminonitrite instead of the chloride. The bath has a longer useful life since no chlorides are introduced on replenishing the platinum content. An improvement[2] on the above bath is said to consist of 100 g./L. ammonium nitrate, 10 g./L. sodium nitrite, 16.5 g./L. of platinum diaminonitrite, and 50 g./L. of 28 per cent ammonium hydroxide solution. A more recently proposed platinum plating bath[3] represents a combination of the phosphate and amminonitrite. It contains 100 g./L. disodium phosphate, 20 g./L. diammonium phosphate, and 6.5 g./L. of diamminoplatinous nitrite.

PLATINUM PLATING BATH

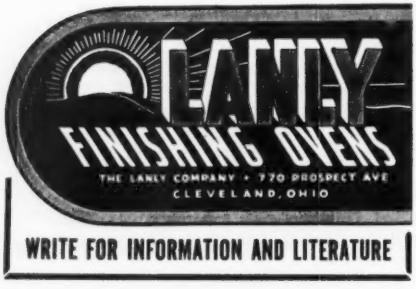
CONSTITUENT	CONCENTRATION
Diammonium phosphate	20 g./l. (2.2 oz./gal.)
Disodium phosphate	100 g./l. (13.4 oz./gal.)
Choloro-platinic acid ($H_2PtCl_2 \cdot 6H_6O$)	4 g./l. (0.535 oz./gal.)

This solution is operated close to the boiling temperature at a current den-

1 Trans. Electrochemical Soc., Vol. 80, p. 489 (1941).

2 Trans. Electrochemical Soc., Vol. 59, p. 273 (1931).

3 Blum and Hogaboom, "Principles of Electroplating and Electroforming," (Third Edition), p. 385, McGraw-Hill Co., New York City (1949).



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A typical bath consists of 8 g./L. palladium amminonitrite dissolved in a small quantity of ammonia, 100 g./L. ammonium nitrate and 10 g./L. sodium nitrite. If this solution is operated with pH above 7, by the addition of ammonia the deposits obtained become smoky rather quickly, but heavier deposits can be built up by means of intermittent scratch brushing. In all cases it is necessary to keep the voltage below the gassing point. If the pH is below 7 the deposits have a tendency to be brighter, but at the same time the danger of peeling increases.

Palladium plating solutions made up with the alkali double nitrites of palladium are interesting in that under certain conditions they can be made self-sustaining. While at a pH above 7 palladium anodes are hardly attacked, they become soluble at a pH below 7. To prepare a bath of this type, 10 grams of sodium palladium chloride (about 4 grams of metal) are dissolved in 500 cc. distilled water and 10 grams sodium nitrite are added.

This bath is operated at about 120 deg. F., with palladium anodes and a current density of about 10 amp./sq. ft. Both the anode and cathode efficiencies are close to 100 per cent. In making up the bath, as described above, the pH should be somewhere around 4. If it is not, it can be easily adjusted by the addition of dilute hydrochloric acid or sodium carbonate as the case may be. For best results the pH should be held between 4 and 5.

to page 66 →

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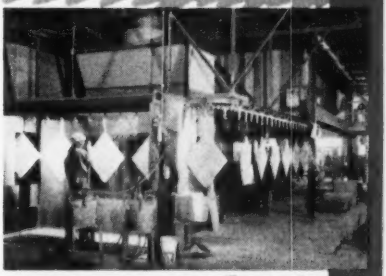

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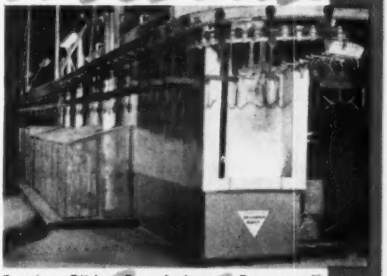

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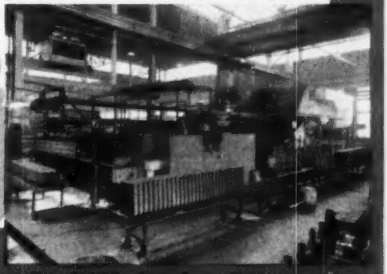

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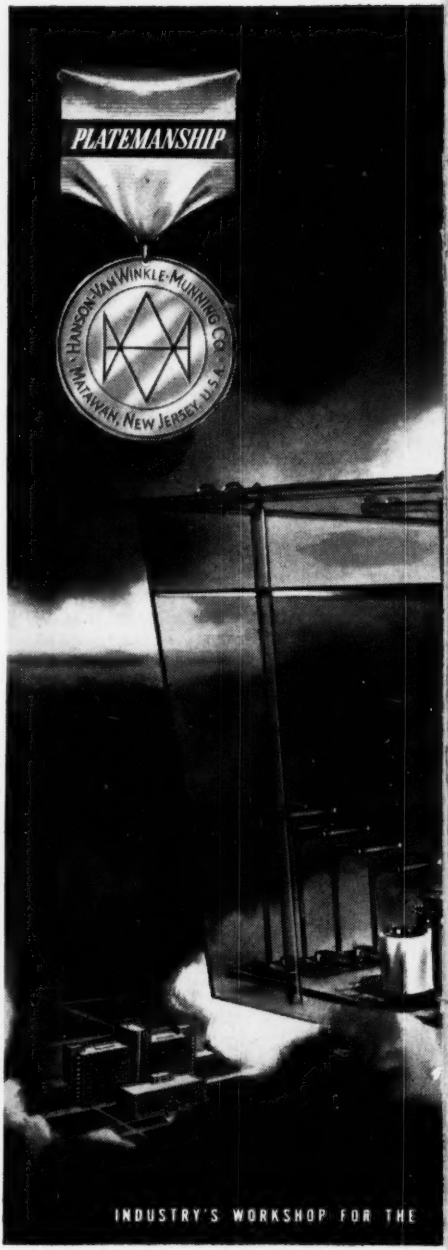

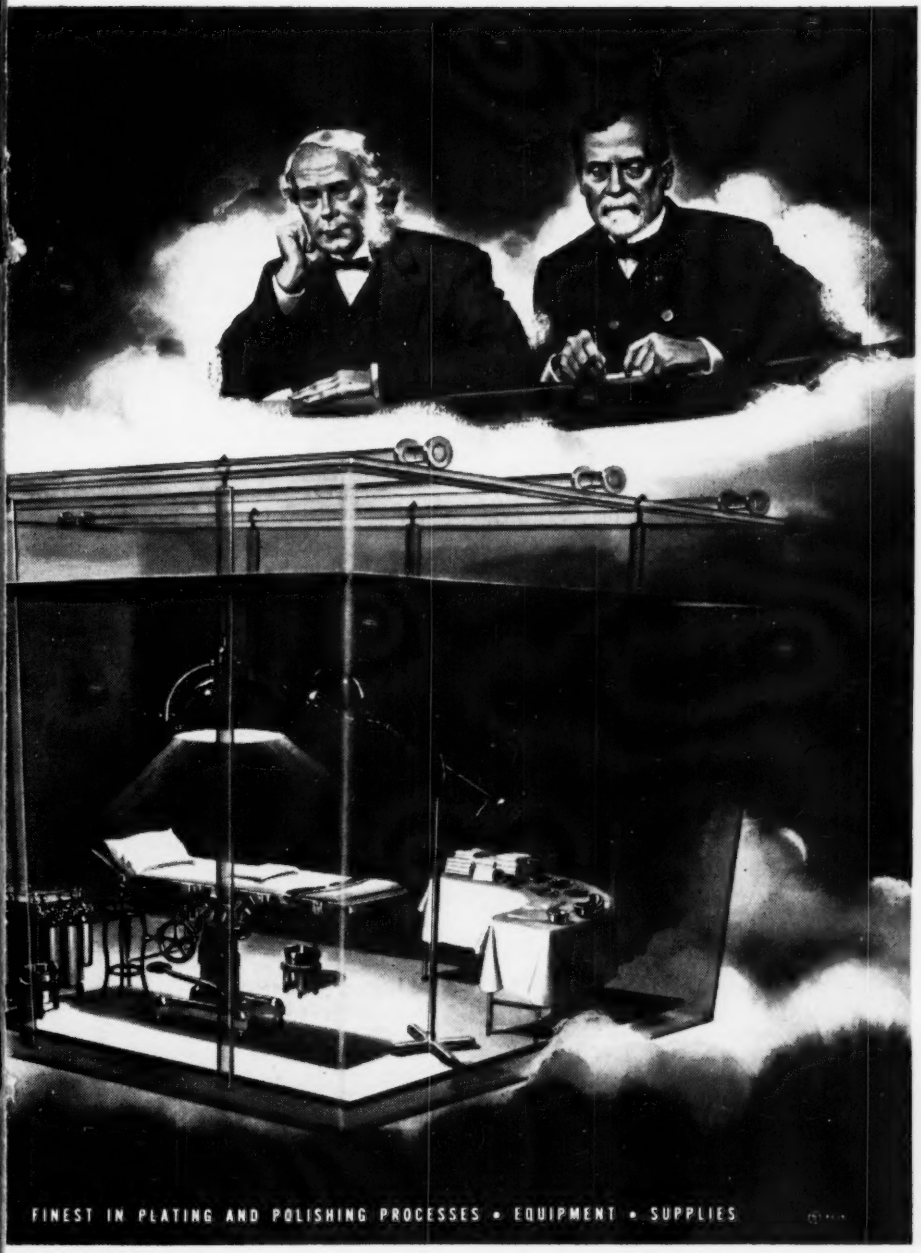
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The deposits from this bath stay bright for a long time and if a slight cloudiness appears it can easily be buffed away. Palladium can be plated on most basis metals and on sterling or fine silver and on gold.

Metal Data. Second Edition. By S. L. Hoyt. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York 36, N. Y. 536 pages. Cloth binding, board covers. Price, $10.00.

Designed for the needs of materials engineers and metallurgists, this new edition includes the most recent information available, and offers new data on such topics as hardenability of H-steels, the recently developed Super Alloys for high-temperature stress members, and other new alloys. The book contains important data selected from reliable sources, presented in a form usable for daily reference. The bulk of the material is in at-a-glance tabular form with a minimum of descriptive text. Nearly 700 tables and graphs provide useful working information on such metallic properties as tensile strength, hardenability, thermal expansion, creep strength, endurance limit, and yield strength at normal, subnormal, and elevated temperatures, and for various conditions of mechanical treatment. Special features include a listing of commonly used test bars, hardness tests, corrosion data, conversion factors, applications of materials, and the properties of elements.

Disposal of Spent Sulfate Pickling Solutions. Prepared by the Steel Industry Action Committee. Published by the Ohio River Valley Water Sanitation Commission, 414 Walnut St., Cincinnati 2, Ohio. 76 pages, illustrated. Price, $2.00.

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The manual discusses: various methods of neutralization; recovery of copperas, sulfuric acid, and similar products; miscellaneous processes. Unit operations are described, and analytical procedures are included.

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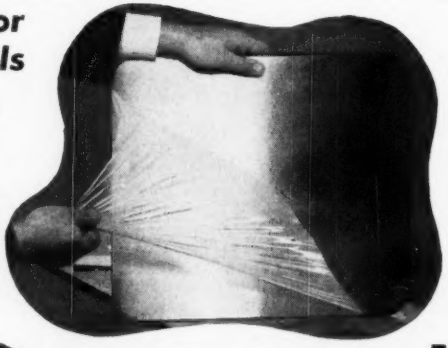
Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.



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Among many advantages, it is nontoxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

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Illinois and Wisconsin Representative
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It takes a specialist like Walt Berger to analytically and creatively solve the metal-cleaning and surface treatment problems of industry. That he has been successful in doing so, is well demonstrated by this famous-name list of those who rely on his practical counsel. Walt Berger's service is significantly Ransohoff service — supported by the fund of technical knowledge gained in 175 years experience on the part of the field and headquarters staffs.

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Practical Applications of modern products

Vinylite Resin Coating Improves Corrosion Resistance of Galvanized Iron

GALVANIZED iron treated with a Vinylite resin-based coating lasted twice as long as ordinary galvanized iron under severe conditions of a salt spray fog cabinet test before showing any sings of corrosive breakdown. These tough yet flexible coatings based on Vinylite plastic resins resist moisture, abrasion, aging, weathering besides corrosive acids, alkalies and most other chemicals. Tests conducted by an oil company in the Texas Gulf Coast area on Vinylite resin-based coatings developed by Plastic Coating Corporation, Houston, Tex., compared durability of these coatings with iron oxide primer and galvanizing under the same severe corrosive conditions. Exposed for 1,204 hours continuously in a salt spray fog cabinet, one panel of corrugated, galvanized iron, unprepared but treated with a wash primer and top coat based on Vinylite resins, showed no signs of corrosive breakdown (top left panel, Fig. 1) throughout the test. The uncoated panel (top right panel) lasted only 672 hours under the same severe conditions before the galvanizing completely deteriorated. This salt spray fog cabinet test consists of a continuous fog of synthetic sea water at 92 to 95 deg. F. and at 100 per cent humidity. Similar tests under these conditions revealed the superior protection of Vinylite resin-based coatings for both wire brushed and sandblasted black iron, degreased before treating. Two black iron test panels, both degreased and wire brushed, were also exposed in the salt spray fog cabinet for 1,204 hours. The panel with a coating based on Vinylite resins showed no corrosive breakdown except at an uncoated, unprotected hole (bottom left photo), while the same panel with a conventional coating of iron oxide

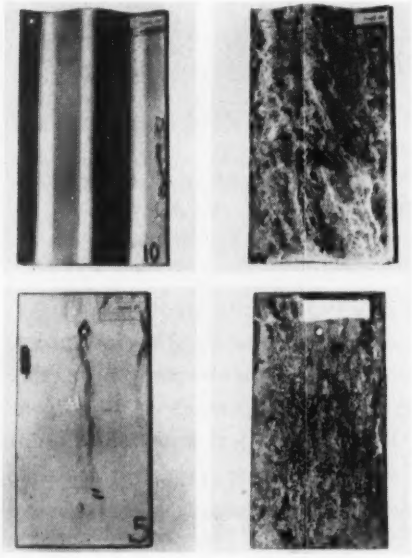


Fig. 1—Four coated test panels after salt fog exposure.
(Photo courtesy Bakelite Co., Div. of Union Carbide and Carbon Corp., New York, N. Y.)

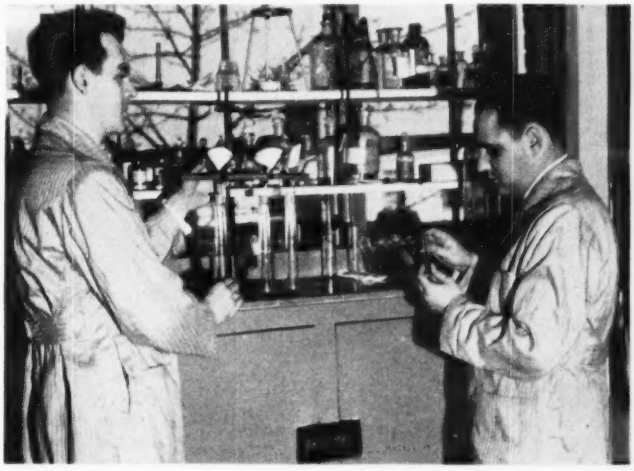
primer broke down completely and showed poorest resistance to salt spray (bottom right photo). Other results of these tests indicated that coatings based on Vinylite resins gave better metal protection when surface was first prepared by sandblasting as against wire brushing. The extreme chemical inertness of Vinylite resins makes coatings based on them ideal for protecting metal surfaces exposed to severe weather conditions and corrosive chemical atmospheres.

Acid-Resistant Laboratory Coats Set Record

THE Cross Island Laboratories of Franklin Square, Long Island, among the first users of Worklon laboratory coats made of 100 per cent Dupont Orlon, report that they are rolling up remarkable records for long wear under conditions usually fatal to most fabrics. Two of the Cross Island chemists, shown here wearing these lab coats, point to almost two years of continuous wear of the same garments under rugged acid and chemical conditions. They also report that during this period the garments were never pressed . . . yet have always had a "just pressed" look. Before adopting these Orlon coats, the men had used up an average of eight cotton lab coats a year—destroyed and burned by acids and chemicals.

Chemists, laboratory and factory technicians, as well as those engaged in electronics and other industrial fields where acid conditions make work clothes replacements frequent and costly, report substantial savings with the use of the new Orlon garments.

Worklon industrial work shirts,



Worklon laboratory coats in use at Cross Island Laboratories.
(Photo courtesy Worklon, Inc., New York, N. Y.)

pants, coveralls and laboratory coats of Orlon resist severe acid and chemical conditions. They are also resistant to oil, grease, paint, dirt, deterioration by sunlight and ultra-violet rays, mildew, moths, and abrasion. They launder and dry quickly, need no ironing, and hold ironed-in creases through weeks of washing. They are lightweight and comfortable, and come in both standard and lint-free finishes.

Molten Zinc Insulated with Vermiculite

A 3-inch layer of vermiculite insulation, placed on top of a vat containing 787 deg. F. hot molten metal, is now being used to protect workers' hands by a large southern wire rolling mill. This granular, mica-like material helps maintain even temperatures, and prevent unnecessary heat loss. The many tiny air cells in each particle of vermiculite slow the passage of heat. According to the Zonolite company, Chicago, producer of this insulating mineral, it works so well that a hand can be placed on the vermiculite.

Molten zinc, employed to galvanize wire in wire rolling mill, insulated with vermiculite.

Blast Cleaning Eliminates Paint Peeling Problem

BY switching from pickling, power sanding and hand methods of cleaning to blast cleaning, Vapor Heating Co., Inc., Chicago, has eliminated a problem of paint peeling on various components of its steam generators, blowers, radiators and other railroad passenger car heating equipment.

In addition, the 8-ft. diameter Pangborn Rotoblast table-room installed here speeds cleaning operations, simplifies handling and substantially reduces man-hours. The company conservatively estimates that the new cleaning equipment is saving them at least 10 man-hours per heating unit.

For each steam generator produced, approximately 25 parts are made ready for painting in the blast cleaning unit. The cleaning operation removes weld slag,

shop dirt, mill scale and rust and thus provides a better bonding surface for the paint. Typical parts cleaned here include large control cabinets for the steam generators, blower housings (Figs. 1 and 2) and welded steel coils (Fig. 3). Cleaning times are: 30 seconds for small, thin pieces; 3 minutes for the harder-to-clean parts; and 5 minutes for the very difficult heat exchanger coils. However, most of the parts are cleaned in 2 minutes.

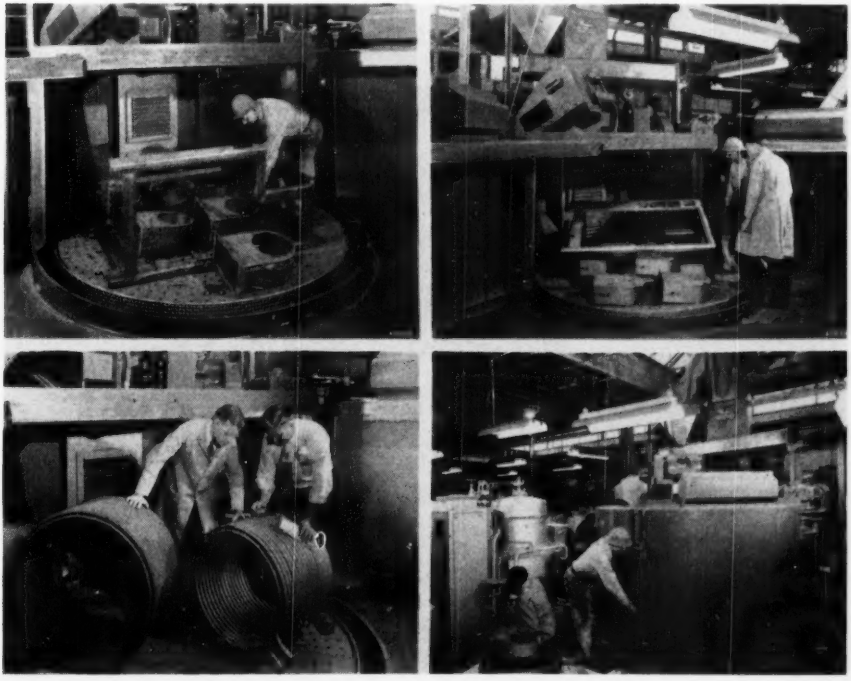
These hot rolled and cold rolled steel parts are painted twice—once before assembly, once after—with a special silicone paint. Before the units were cleaned by blasting, both coats of paint were gray. However, the qual-

Fig. 1 (Top Left)—BEFORE—A table load of blower housings and large steam generator control cabinets are cleaned by Vapor Heating Co., Inc., in its 8-ft. diameter Pangborn Rotoblast table room

Fig. 2 (Top Right)—AFTER—Cleaned parts have satin smooth finish and are free of weld slag, mill scale, rust and shop dirt. Paint does not peel from these blast-cleaned parts.

Fig. 3 (Bottom Left)—The Rotoblast table-room also cleans effectively the multi-surfaced welded steel heating coils.

Fig. 4 (Bottom Right)—Table at floor level makes loading easy. To left of Rotoblast table room is a completed Vapor-Clarkson steam generator which will be installed in a diesel locomotive to make the steam to heat a streamline train.



ity of cleaning with the blast unit is so high—it produces a satin smooth, gray finish—that painters, at first, had a difficult time in the touch-up operation distinguishing between painted and unpainted spots. For this reason, the first coat is now tan; the second, gray. With the two-color method, each unit is assured of two complete layers of protective paint.

The blast unit was installed in the cleaning department with its rotating table at floor level. As a result, loading and unloading operations are simplified. Also, the company has eliminated the extra work in cleaning and handling that resulted when parts that could not be finished satisfactorily by pickling and grinding were sent out to a commerical blast cleaner.

The Rotoblast table room is manufactured by Pangborn Corporation, Hagerstown, Md.

Bulletin G-102. Hanson-Van Winkle-Munning Co., Matawan, N. J., has published an 18-page bulletin on their low voltage-direct current motor generator sets. Listed as some of the applications for generator sets are: electroplating, electrocleaning, anodizing, manodizing, electropolishing, electrolytic production of chemicals. Listed and illustrated are the construction features of the H-VW-M generator sets. The bulletin includes general specifications, installation views in addition to illustrations of 14 different sets, efficiency curves, illustrations and descriptions of control panels, and notes on voltage regulation.

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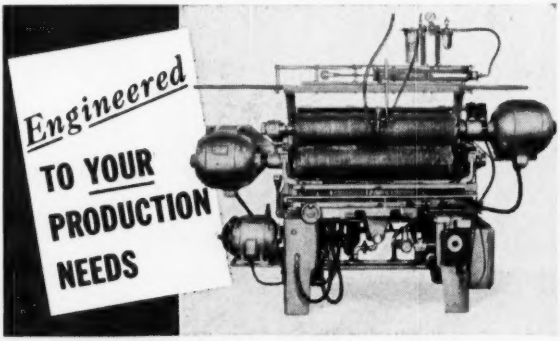
Working closely with your engineers we will develop a custom machine designed for maximum surface finishing efficiency on your particular application. Totally enclosed, abrasion-proof hydraulic circuits assure uninterrupted production and vastly reduced maintenance costs.



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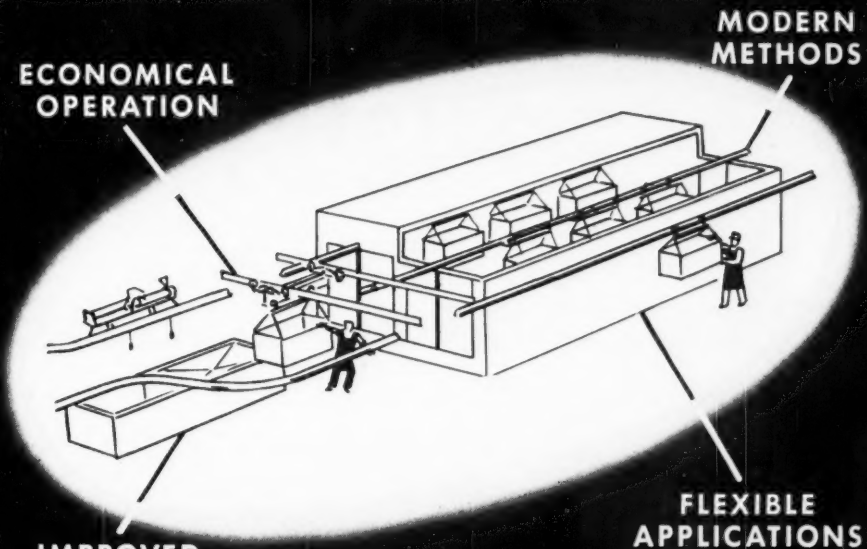

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Morrison is the choice of the metal industry for better and more efficient operations.

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NEWS of the Industry

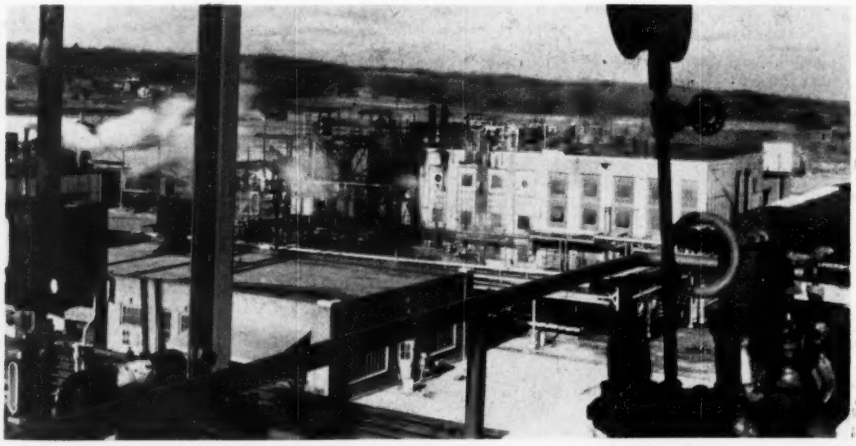
NEW PLANTS

Expanded facilities for the manufacture of silicone materials to meet increasing industrial demands were put in operation recently at the **GENERAL ELECTRIC COMPANY'S** vast silicone chemical plant at Waterford, N. Y. The company said that the expansion, costing in excess of $5 million, gives its Chemical Division a silicone production capacity comparable to any in the country.

Coincident with the expansion of processing equipment, laboratory services have been doubled and employment is up 50 per cent from a year ago.

FREDERICK B. STEVENS OF CANADA LTD., has announced the completion of new plant facilities in the Windsor, Ontario buffing composition plant.

The new equipment was specially designed for Stevens of Canada to produce,



General view of part of the new manufacturing facilities at the General Electric, Waterford, N. Y., silicone plant where a $5,000,000 expansion program was completed in January 1953.

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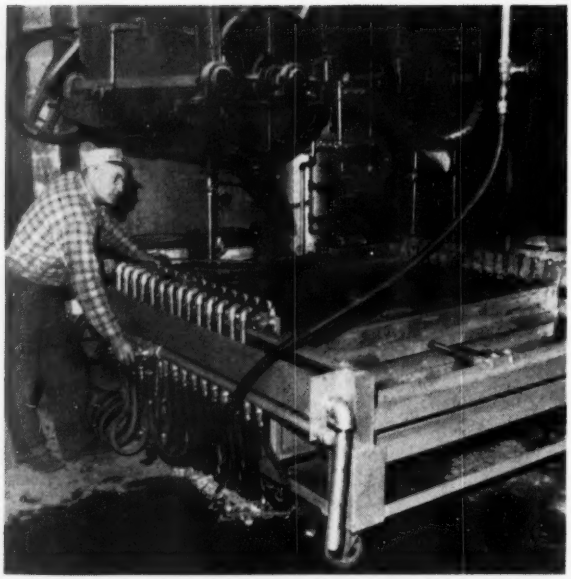


Adjusting the special water cooling valve on a new compound forming rack at Stevens of Canada Buffing Composition plant in Windsor.

in quantity, finishing compounds that would be more uniform in quality, texture and dimensions.

New mass production forming equipment, designed for ease in materials handling, and special cooling apparatus help achieve the uniform quality, texture and cake size.

This new equipment was developed because of the splendid results obtained with similar equipment in Stevens' modern composition plant located in Detroit, Michigan.

THE BARBER-WEBB CO., INC., has opened a new plant at 3864 South Santa Fe Ave., Los Angeles 58, California. This new plant has increased the firm's operating space by approximately four times that of the South Gate plant.

As the exclusive licensee of the B. F. Goodrich Company for Koroseal tank lining material, Barber-Webb will continue to render the best possible service to western industry whether the work is to be done at the Barber-Webb plant or at the plants of its customers.

Barber-Webb wishes to extend its sincere thanks to its most valued customers who have made this development possible, and at the same time pledge even greater cooperation with industrial plants toward the solving of their particular corrosion problems.

THE GLOBE COMPOUND COMPANY., INC., has announced completion of a new factory and office building at waterbury-Bristol Rd., Route 69, Wolcott, Conn. The building provides expanded facilities for production, laboratory research and technical services in the field of buffing compositions.

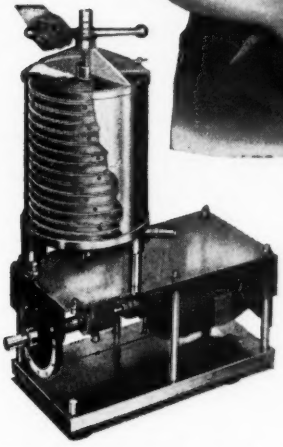
COMPANIES

DeBOTHEZAT FANS DIVISION OF AMERICAN MACHINE AND METALS, INC., has announced the appointment of **H. S. McKENZIE COMPANY** as their new representative for Oregon and southern Washington. They will handle DeBothezat's complete line of industrial ventilating equipment, with offices at 100 Northeast Holladay, Portland 14, Oregon.

THE GLIDDEN COMPANY has announced the opening of a complete new industrial finishes service center and warehouse at Collinsville, Va.

Featuring technical and color styling aid and a laboratory for the development and testing of special finishes, the new center will also provide warehousing facilities for Glidden customers throughout the important North Carolina-Virginia manufacturing region. It is designed to provide maximum service to Gildden customers by moving expert technicians and essential materials to the producer's front door.

guard against Rejects



"Sealed Disc" Filters were designed especially for plating rooms. They're smaller, compact, and more portable than ordinary conventional Filters, and they are also performing satisfactory results on many acid dips, electro cleaners, and solvents.

You Can Be Sure With A "Sealed Disc" Filter

More and more cost-minded platers depend on Alsop "Sealed Disc" Filters to remove dirt, dust, and sludge from their plating solutions. They get better finished plated work—they save time and labor, and their plating solutions last longer. The "Sealed Disc" Filter assures positive, trouble-free performance that's proof against even the invisible impurities that cause nodules and porousness—proof against rejects and reworking. There's a "Sealed Disc" Filter "to fit your job"—write for complete information, the Alsop Engineering Corporation, 803 Keen Street, Milldale, Connecticut.

ALSOP ENGINEERING CORPORATION

Filters, Filter Discs, Pumps, Tanks, Mixers, Agitators

The center will also have on hand at all times an extensive selection of base materials, from which staff members will be able to provide fast, on-the-spot color creating, color matching and formula modifications.

C. P. O'Connell and M. P. Roske have been appointed sales representatives for the center.

KNAPP MILLS, INCORPORATED, of New York, has announced a new, highly versatile automatic machine said to produce a perfect chemical bond between lead and steel. In one day one small machine will clad a steel surface that would require 8 to 10 man-hours to cover by hand techniques, according to Alfred P. Knapp, president of the company.

With this new method the steel is first prepared through leadizing, then lead of any desired thickness can be applied. The lead will not separate from the steel in service unless it is melted off at temperatures close to 621 deg. F., the melting temperature of lead itself.

The Knapp Automatic Lead Cladding Machine will chemically bond a strip of lead up to 12 inches wide by ¼-inch thick to prepared steel. The operator can control the width and thickness of the lead cladding by regulating the speed of the machine and by spreading or narrowing the two cladding heads with which it is equipped.

An important advance in design over earlier models makes it unnecessary for the machine to carry its own lead supply. A strip of lead is laid down under the machine; the cladding heads melt this lead and chemically bond it to the steel as the machine automatically moves across the plate. The machine is so designed that it may also carry its own lead supply in tubular feeds at the front of the unit. While the machine may run free, directly on the steel, it will also operate on a track. By taking off the bottom carriage, reversing it, and mounting it on the top of the machine, the unit will run on a light weight aluminum or magnesium beam so it operates in a tank shell as well.

The whole carriage may be turned to clad lead on either the right or the left side. With all of its versatility and many functions, the unit illustrated weighs less than 15 pounds. Even though the cladding heads direct intense heat on the lead and steel beneath them, the machine itself does not even become warm in operation.

A hand operated model has also been designed. This hand tool may be used to burn lead to lead as in welding sheet lead pipe. The hand unit, weighing less than 10 pounds, operates without a carriage on a single wheel or tripod arrangement with a grip for the operator.

Knapp Mills expects that these new machines will have a major effect on the price, availability and utility of lead clad steel which is already a major clad metal for use in the fabrication of equipment for the chemical process, nuclear and metallur-

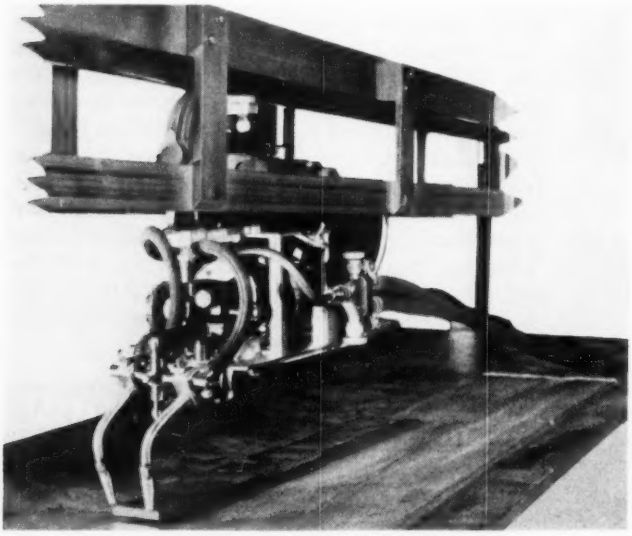
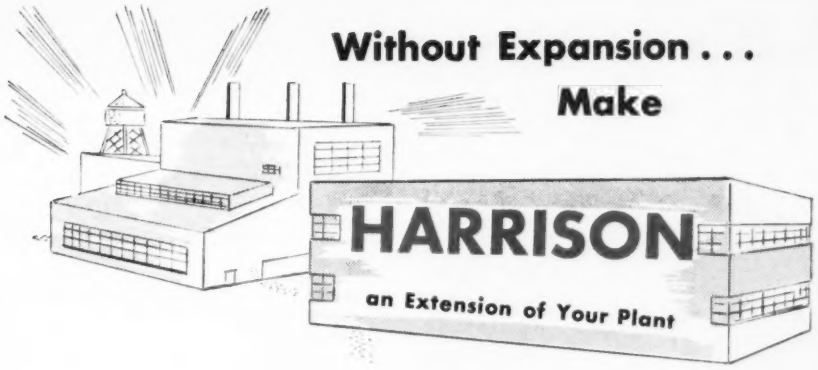


Fig. 1—This view illustrates the Knapp Automatic Lead Cladding Machine suspended from a rail along which it moves propelled by its own power, cladding lead to the prepared steel below.



Harrison's long technical and practical experience . . . plus interested, active cooperation in solving your particular requirements . . . makes available to you a service similar in many ways to a department of your own plant.

Harrison's successful record of developing and applying buffing, polishing and other finishing compounds to meet exacting standards can well be placed advantageously in your service as it has with others.

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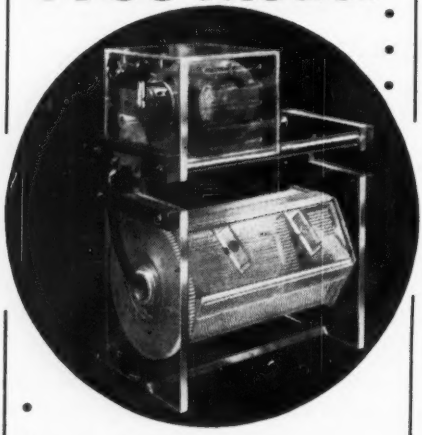
the
1953 Model



Portable Lucite Plating Barrel

THE STUTZ PORTABLE PLATING BARREL is designed and constructed of High Temperature Lucite to provide continuous processing of piece parts through the operation of Alkali Cleaning, Water Rinsing, Acid Treatment and Plating. Progression through these operations is made by manual handling or if necessary with the assist of an overhead traveling hoist. The STUTZ PORTABLE PLATING BARREL is made in two sizes with cylinders having inside dimensions of 6" x 12" and 8" x 18". Standard perforations are 3/32" or larger. Smaller openings can be furnished as required. All gears are ½" High Temperative Lucite. Gear bearings are permanently lubricated. New heavy duty motor. Operating temperature up to 185° F.

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gical industries. The clad metal produced by Knapp Mills has been identified by the company as Ferrolum.

The first commercial production of a new material for the nation's chemical processing industries has been announced by **HERCULES POWDER COMPANY.**

Plastics and protective coatings will probably be the most important applications for the new commercially available chemical, dimethyl isophthalate.

The first commercial production of DMI (the trade designation under which dimethyl isophthalate will be sold) was achieved by Hercules in a special unit at its Burlington, New Jersey, plant after months of research at the company's Experiment Station in Wilmington.

The product which Hercules is making is isophthalic acid in the form of its low-melting, easily processed methyl ester. Research men have recognized that isophthalic acid offers advantages over phthalic anhydride in the preparation of plasticizers, alkyds, and polymers; but it has never been available in any quantity at prices that would permit its commercial use, or even at a low enough price to stimulate research towards its application in industry.

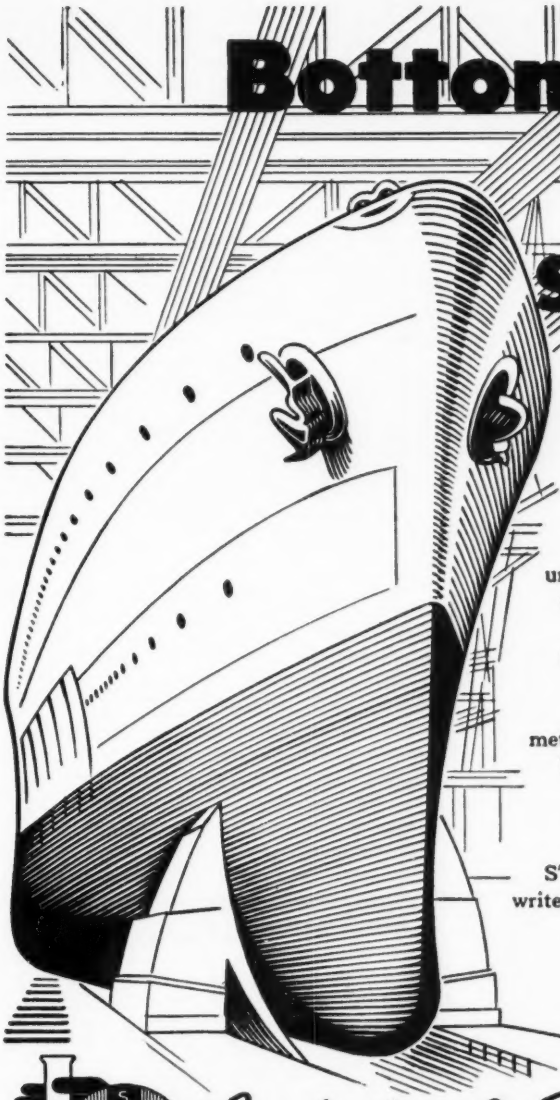
Some of the advantages indicated by the new material include plasticizers with improved low-temperature efficiency and lower volatility; tougher, longer-lasting protective coatings based on oil-modified alkyd resins; and improved toughness in laminating resins.

Joe A. Stone, executive partner of the **DIVISION LEAD COMPANY,** 836 W. Kinzie St., Chicago, Ill., has announced the purchase of the Eagle-Picher Company Metallic Products Division plant at Argo, Illinois.

According to Mr. Stone, equipment and personnel of the Metallic Products Division will be retained and immediately absorbed into the combined operation.

Division Lead's present plant is scheduled to become primarily a distribution center, with portions of the space given over to increased industrial research. Most other phases of work will be transferred to Argo, department by department, during 1953. Additional space now available at Argo is estimated at 100,000 square feet, with brick buildings housing both production and warehouse facilities. The

Bottoms up! for Stantite



STANTITE Spraying Primer has passed the tough test of a ship's bottom with colors flying. That's why many ship owners are undercoating with STANTITE to minimize corrosion and rust creep. And on land, wherever metal is coated, rust-inhibiting STANTITE also provides excellent adhesion to any metal surface, with most top coats. Ideal under air-dried or baked finishes, it dries rapidly . . . is unimpaired by any baking schedule. Find out *now* what STANTITE can do for you . . . write today: Stanley Chemical Co., 21 Berlin St., East Berlin, Conn.

STANLEY

Industrial Coatings

STANLEY CHEMICAL

LACQUERS — SYNTHETICS — JAPANS — ENAMELS

present office space will be doubled as soon as construction can get underway.

Division Lead's West Coast sales representative is **BUCKY HARRIS** of Standard Wire and Cable Company, 3440 Overland Ave., Los Angeles; its new York representative is the **KENNETH E. HUGHES COMPANY**, 17 W. 60th St., New York.

The largest item of equipment featured in the 1952 National Metal Exposition held in Philadelphia was purchased from the show floor by **DENNIS MITCHELL INDUSTRIES** of Philadelphia. This equipment, a Frederick B. Stevens Full Automatic Barrel Processing Machine, occupied a total floor space of about 624 sq. ft. and was moved directly from the show floor for immediate installation at the Dennis Mitchell Plant.

The new machine will be used for zinc job plate operations as well as the processing of the company's regular line of bicycle baskets, laundry carts, shopping carts and stroller baskets.

HARSHAW SCIENTIFIC, DIVISION OF HARSHAW CHEMICAL CO., has announced plans to participate in the Western Metal Exposition to be held in Los Angeles, March 23-27. Booth No. 738 will be devoted to an exhibit of Harshaw's induction furnaces, analytical balances, specimen preparation equipment, spectrophotometers, pH meters, metallurgical microscopes, and combustion boats, tubes and accessories. J. H. Schering, D. W. Raworth, R. McClure, C. Schreck, and J. M. Manypenny, of the Harshaw Los Angeles branch office will be in attendance at the exhibit.

Ralph Andrews, president of the **MORSE MANUFACTURING COMPANY, INC.**, of East Syracuse, N. Y., has announced that the materials handling equipment firm is celebrating its 30th year of continuous production. Incorporated in 1923, Morse has steadily increased development and production of its drum handling equipment, drum trucks, rotators, and dollies, and recently erected a new plant at 727 West ManLius St., East Syracuse. According to Mr. Andrews, future plans include new additions to the Morse line of products and further expansion of plant facilities.

THE KEYSTONE CHROMIUM CORP., of Buffalo, N. Y., has been licensed as a custom processing plant for the Electrofilm Lube-Lok process in the Buffalo area, it has been announced by A. R. Booker, president of **ELECTROFILM CORPORATION**, North Hollywood, Calif.

The addition of Electrofilm Lube-Lok to the many fine services now being performed by Keystone provides manufacturers in the Buffalo area with the best of facilities and workmanship for the application of the Electrofilm Lube-Lok process.

NEW POSITIONS

Announcement has been made by R. E. Wilkin, general sales manager, Hooker Electro-chemical Company, of the appointment of **WILLIAM L. GILLESPIE** as field salesman for Chicago and the Midwest area. Mr. Gillespie has been with the Hooker Company since 1939, having been in the development and research department in various capacities until 1950.

Also announced was the transfer of **HAROLD WEVER** to technical sales service. Mr. Wever has been at Hooker since 1943 and had been in the development and research department of the company prior to his recent transfer. He is a

... cut paint stripping costs in half!
Write us today for free samples and see how one of Pelron's new cold strippers can give you better paint stripping results at about one half the cost. This is possible because they can be used cold — exactly as delivered with no costly time for preparation. And you get a job that is comparable with any available hot stripping compounds. On top of that, Pelron strippers are non-toxic and will not injure any metal surface or damage clothing.
Pelron's new strippers are: Unisol 45 especially developed for removing baked enamels; Unisol 199 for fast stripping of Japan and vinyl finishes; and Unisol 240 for lacquers. Write today for free samples and see how Pelron can solve your stripping problems.
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INDUSTRIAL OILS AND CHEMICALS FOR BETTER PRODUCTION AT LOWER COST
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member of the Electrochemical Society and of the American Chemical Society.

Burtron Zook

F. V. Jensen, president of Jensen Specialties, Inc., Detroit, has announced the appointment of **BURTRON ZOOK** as sales manager for Jensen industrial ovens and heating equipment.

Mr. Zook has served with Jensen as a sales engineer for the last seven years. He has 17 years' experience in industrial sales engineering, the last 13 of which have been in the infra-red heating field.

PAUL H. GOODELL, sales manager for three years, will be retained in a consulting capacity on engineering and development problems connected with Pan-L-Heat Radiant Rod Ovens.

Two appointments were announced at Norton Company recently. **DAVID REID,** assistant superintendent of Organic Products, was named superintendent of Grain and Bond Plants and **ROGER J. DUFRESNE,** assistant foreman, Resinoid Department was appointed assistant to the superintendent of Organic Products.

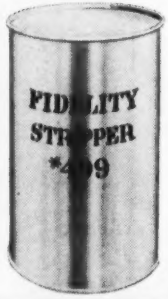
Mr. Reid first came to Norton Company in 1935, and has since held many technical and engineering positions. Transferred to the Research Laboratory in 1944, he is one of the men who developed the new electric furnace straight line production which revolutionized the manufacture of grinding wheels.

Mr. Dufresne joined the organic section of Norton's manufacturing control department in 1946. In 1950 he became assistant foreman of the Resinoid Department, prior to recall to active duty as a Lt. j.g. in the Navy that year.

Appointment of **A. C. HOBBIE** as manager of the Corona Chemical Division of Pittsburgh Plate Glass Company has been announced by E. D. Peck, vice president of the Paint and Brush Division.

Fidelity ENGINEERED COMPOUNDS

FIDELITY STRIPPER No. 499



FIDELITY STRIPPER No. 499 removes with complete success almost all types of baked and air-dry lacquers and synthetics. It may be used on almost all metals including aluminum and steel.

This specially formulated, cold stripper is a non-inflammable, water-white liquid with an ammoniacal odor. There is nothing more powerful (may be used over and over again).

Write, detailing your paint stripping problems. Send samples to be stripped, if possible. No charge.

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The small oven illustrated is shipped completely assembled, thoroughly tested and ready to operate. Installation is a one-two process: Spot in place . . . make connections . . . and you're ready for production.

Write for booklet, "Industrial Ovens," showing typical installations.

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Electric laboratory type oven used by noted resistor manufacturer in making TV set components. Uniform drying heat is provided by recirculation of air provided by blower and heaters enclosed in base.

Prior to his appointment, Mr. Hobbie was manager of the Micronized Products Department of Corona Chemical Division at Moorestown, New Jersey. In his new position he succeeds Walter W. Ethier, Jr., who was named assistant divisional director at Newark, New Jersey, a new position.

A native of Rochester, New York, Mr. Hobbie will have his headquarters at Pittsburgh and Moorestown.

The F. J. Stokes Machine Co., Philadelphia, Pa., has announced the appointment of **RICHARD T. VOELZ** and **TRUMAN S. BROWN** as field representatives for the Chicago and Los Angeles sales offices, respectively.

Mr. Voelz, a graduate in Mechanical Engineering from the University of Wisconsin, also holds a Masters' Degree from Northwestern University in Mechanical Engineering. He worked for the National Engineering Co., Chicago, Ill., prior to his joining the Stokes organization.

Mr. Brown attended the University of Minnesota Engineering School and the University of Illinois where he majored in Business Administration. Previously employed by the Northwestern Bell Telephone Co., Mr. Brown will be working under Ray B. Anderson, Jr., district manager of the Stokes West Coast office in Los Angeles.

Walter W. Ethier, Jr.

Appointment of **WALTER W. ETHIER, JR.**, as assistant divisional director at Newark, N. J., a new position, has been announced by E. D. Peck, vice president in charge of Pittsburgh Plate Glass Company's Paint and Brush Division.

A native of Milwaukee, Wisconsin, Mr. Ethier was manager of the Corona Chemical Division prior to his appointment. He started with Pittsburgh Plate Glass Company in the technical department of the firm's Milwaukee paint plant in 1939. After serving over four years in the Paint Division purchasing department, he was made manager of the Corona Chemical Division in 1948.

Appointment of **ALAN B. CASTATOR** as general sales manager for Pittsburgh Plate Glass Company brush division factories at Baltimore, Md., and Keene, N. H., has been announced by E. D. Peck, vice president in charge of the firm's paint and brush division.

Associated with Pittsburgh Plate Glass since 1931, Mr. Castator previously served in sales capacities at Philadelphia, and during the past five years as assistant manager at the Detroit warehouse.

W. E. SANTORO has been appointed head of the research division of The Monroe Sander Corporation of Long Island City, N. Y.

Mr. Santoro was formerly associated with the Standard-Toch Chemical Company of Staten Island. He is a member

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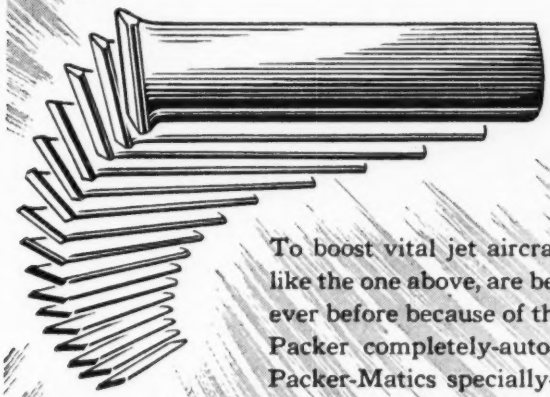
ALBERT LEA, MINNESOTA

Jet blade production increased



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of the American Chemical Society, American Oil Chemists Society, American Society for Testing Materials, Federation of Paint and Varnish Production Clubs, the New York Paint and Varnish Production Club, a Charter Member of The Forest Products Research Society and a Fellow of the American Institute of Chemists.

CHARLES S. ALTEMUS has been appointed New England sales representative for Solvents Recovery Service, Inc., of Westfield, N. J., according to an announcement by Carleton H. Boll, vice president and general manager.

Mr. Altemus' background includes eight years' experience with a well known manufacturer of lacquers and synthetics. During the war years he was chief chemist and production manager of this company. He has just finished an intensive training program in the Lofgren Process for refining waste industrial solvents.

Announcement has been made of the appointment of **ROBERT C. AIKIN** as general sales manager of Standard Paint and Varnish Company, Ltd., of Windsor, Canada.

Robert C. Aikin

Mr. Aikin was transferred from the Rinshed-Mason Company, Detroit finish manufacturer, which company recently purchased Standard. He had been assistant automotive-industrial finishes sales manager at R-M. Prior to this, he had been with Sherwin Williams Company, where he had once been credit manager, then progressively in maintenance finish sales, automotive refinishing and industrial finish sales.

New assignments for two members of the Diamond Alkali Company sales organization, **JUSTUS U. BELVILLE** and **KEMBLE S. LEWIS**, have been an-

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Want a more durable, more attractive paint finish on your metal product . . . to cold form metal more efficiently, more economically . . . to protect iron and steel parts from rust . . . to assure smooth break-in and long service on friction parts?

Parker Rust Proof has products which will produce these benefits for you. Bonderite anchors paint to metal. Bonderite and Bonderlube are helping to revolutionize cold forming. Parco Compound controls rust. Parco Lubrite retards wear. They're all *proven* products, easy to use, dependable, uniform in results.

Back of every Parker product and its performance in your plant is our thorough knowledge and wide experience in surface treatments for metals. All we've learned in 38 years goes to work for you when you *call on Parker.*

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PARKER ***RUST PROOF COMPANY***
2172 E. Milwaukee, Detroit 11, Michigan

BONDERITE corrosion resistant paint base

BONDERITE and BONDERLUBE aids in cold forming of metals

PARCO COMPOUND rust resistant

PARCO LUBRITE wear resistant for friction surfaces

nounced by W. H. McConnell, director of sales.

Mr. Belville has been appointed staff assistant to J. C. Forsyth, manager of Alkali Specialty Sales at the company's general headquarters in Cleveland; and Mr. Lewis has been appointed assistant manager of Diamond's Chicago Branch Sales, the position formerly held by Mr. Belville.

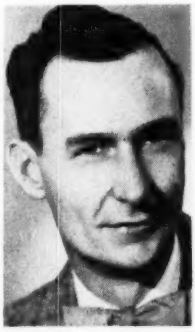
American Brake Shoe Company announces the election of **KEMPTON DUNN** as first vice president, **WILLIAM B. JORDAN** as treasurer, **ROBERT WATTS** and **OWEN B. COTTLE** as assistant treasurers.

O. B. WILSON has been named industrial instruments sales manager for the Industrial Division of Minneapolis-Honeywell Regulator Company, Philadelphia, is the announcement received from L. Morton Morley, vice president.

Mr. Wilson joined Honeywell in 1923. He was industrial manager in Chicago, New York and other offices. In 1948 he was made industrial manager for the eastern sales region. Early last year Wilson was named field sales manager for the Industrial Division.

Wagner Brothers, Inc., Detroit manufacturer, has announced the appointment of **BERT HAWHEE** as sales representative for Indiana.

According to O. H. Tiedeman, vice president in charge of sales, Mr. Hawhee will handle the entire Wagner line of plating and polishing supplies and equipment. He will locate in the newly established office at 3016 North Illinois St., Indianapolis, Indiana.



Bert Hawhee

PHILIP C. STAPLES has been appointed Chicago district sales manager of the Industrial Chemicals Department of the Pennsylvania Salt Manufacturing Company. He replaces **JOHN C. HAMPSON**, who has returned to the Philadelphia office as product supervisor in the same department.

The directors of the Hilo Varnish Corporation, 376 Third Street, Everett 49, Mass. accepted with regret the resignation of **CARL J. SCHUMANN** as president and director. Mr. Schumann completes a long and distinguished career in the paint industry and his associates extend to him their best wishes for many more years of health and active participation in his many other interests.

At a recent meeting, **EUGENE E. MORTON** was elected President of the Hilo Varnish Corporation to succeed Mr. Schumann.

JOHN HELLSTROM, vice-president of American Air Filter Company, Louisville, Ky., has been appointed director of sales of all AAF and Herman Nelson products. He will return from San Francisco, where he organized and managed the company's Pacific Division.

For Platers, Silversmiths, Jewelry Mfgrs., Makers of Watches, Clocks and Electronics and other metal finishers.

Supplied in straight or crimped brass, steel, nickel silver or stainless steel wire in sizes .0025 to .006 and in bristle, fibre or Nylon. Special sizes and shapes to order.

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The American Buff Company, Chicago, has announced two new appointments to its sales staff.

ALBERT J. HEBSACKER has been assigned to cover the Detroit area, and part of Ohio. His headquarters will be in Detroit, under the supervision of Stanley P. Sax, vice president of the Company.

FRED HOFFMAN has taken over part of the Indiana and Kentucky territory with Indianapolis as his headquarters.

EDWARD S. HAWKINS has been appointed vice-president and general manager of the West Coast Division of Rinshed-Mason Company, Detroit, Mich., according to a recent announcement by company president Frederick G. Weed.

The company manufactures automotive, industrial and architectural paints; and its West Coast Division in Anaheim, California, has been under the general managership of Mr. Hawkins since 1950 when the division was established.

RALPH MATTERS, who assisted in the establishment of the Anaheim plant, has just been appointed sales manager of this division. He has been with R-M since 1929.

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S. J. STOWELL has been appointed merchandise manager of the Kold-Hold Manufacturing Company, Lansing, Mich., according to an announcement by J. R. Tepfer, vice president and general sales manager. He is responsible for correlating sales of all the company's products.

DAVID B. TYLER has been appointed advertising manager of Norton Behr-Manning Overseas Inc., according to an announcement by Philip N. Cooke, vice president.

Mr. Tyler has been a member of Norton Company's publicity department since 1948 and was appointed to the staff of Norton Behr-Manning last June, responsible for all foreign advertising. His office will remain in Worcester.

American-Marietta Company has announced that **HARRY N. WALKER**, vice president in charge of procurement, has been appointed to a new executive position with the American-Marietta organization in Cleveland, Ohio.

Mr. Walker will serve as a staff assistant to Kenneth E. Clarke who heads up both American-Marietta's Ferbert-Schorndorfer Division and the Arco Company.

In addition to his management and administrative activities, Mr. Walker will devote considerable attention to business development for both organizations.

Four promotions have been announced by The Norton Company, Worcester, Massachusetts.

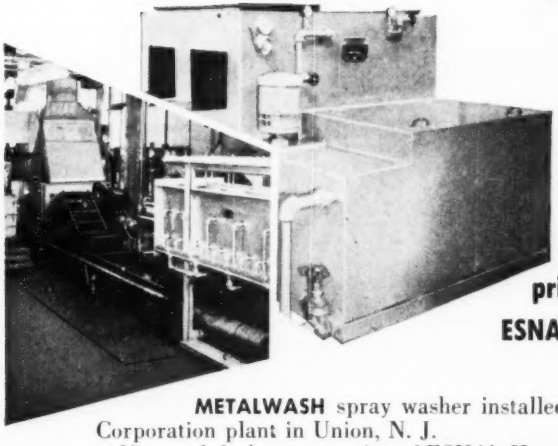
JOHN JEPPSON, formerly assistant secretary and works manager, was appointed vice president. He remains as works manager of the company's Abrasive Division.

A. DONALD KELSO, president of Norton Behr-Manning Overseas Inc., since last October, became a Norton Company vice president in charge of foreign operations and a director. Mr. Kelso retains his Norton Behr-Manning Overseas Inc. post as well.

HOWARD J. DALY, manager of Bauxite and Crude Abrasive plants was elected to the board of directors.

RICHARD PROUTY, formerly assistant to the treasurer, was appointed assistant secretary of the Company.

productive WASHER installation



#2744

for cleaning prior to tempering of ESNA* self-locking nuts

METALWASH spray washer installed at Elastic Stop Nut Corporation plant in Union, N. J.

View at left shows a portion of ESNA's Heat Treating Department. Self-locking nuts are conveyed through two American Gas Reciprocating Furnaces into AGF conveyorized quench tanks. Mesh conveyors carry the work into **METALWASH** hot spray washer where quenching oil is removed prior to tempering.

METALWASH machine conveys the work directly into continuous tempering unit (not visible in photo).

*ESNA is the registered trade mark of Elastic Stop Nut Corp. of America.

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For more complete information on products and processes use READER SERVICE CARDS inside covers.

Appointment of **MAURY E. LIPPERT** as general sales manager has been announced by Sipi Metals Corp., Chicago smelters of non-ferrous alloys and warehouse distributors of aluminum ingot.

Mr. Lippert has been active in metal sales for 33 years. His background in the smelting industry particularly qualifies him to coordinate the activities of Sipi's salesmen and distributors.

According to an announcement by Ralph M. Johnson, vice president, **PAUL B. FOXWELL** has been appointed abrasive engineer for Norton Co., Worcester, Mass. Mr. Foxwell will cover the western Missouri, eastern Kansas, and Oklahoma territories. He graduated from the Virginia Polytechnic Institute in 1950 with a B.S. degree in Industrial Engineering.

A second appointment is that of **ROGER MAGOUN** as Norton Company's economist. He succeeds Stephen P. Foster who recently retired after 32 years with the company. Mr. Magoun graduated from the Harvard Engineering School and joined Norton's Abrasive Division in 1928. He spent 20 years in the Grinding Machine Division and was appointed assistant economist in 1949.

MEETINGS

THE MASTERS' ELECTRO-PLATING ASSOCIATION, INC., has announced its 35th Annual Banquet to be held at the Belmont Plaza Hotel in New York City on Saturday, April 11, 1953. Attendance will be by invitation only. Cocktails will be served from 6 to 8 P.M. followed by a banquet. A Banquet Journal will be published in connection with the event.

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The **ANNUAL EDUCATIONAL SESSION AND DINNER DANCE** of the **CINCINNATI BRANCH, A.E.S.** will be held on March 28 at the Sheraton-Gibson Hotel.

The Educational Session, beginning at 2:00 P.M. with Clyde Kelly, A.E.S. 3rd vice president, Session Chairman, presiding, will feature the following program:

1. "Impressions of the Japanese Finishing Industry," Ezra A. Blount, Editor, Product Finishing.
2. "Principles of Effective Job Shop Management," Carl F. Hansen, Owner, Advance Tinning Co., Chicago, Ill.
3. Symposium on Waste Treatment.

"Why We Must Treat Our Waste," Hudson Biery, "Ohio Commissioner" to the Ohio River Valley Water Sanitation Commission.

"Methods for Treating Metal Finishing Wastes," H. S. Kline, Industrial Hygiene Engineer, Frigidaire Div., G.M.C., Dayton, Ohio.

Members of the Waste Treatment Fanel, in addition to Mr. Kline and Mr. Biery, are: J. E. Kinney, Sanitary Engineer, Ohio River Valley Water Sanitation Commission, and A. M. Reed, Chemist, Electric Auto-Lite Company, Lockland, Ohio.

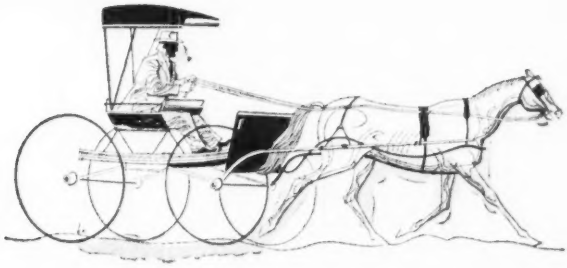
The dinner, entertainment, and dance will begin at 7:00 P.M., featuring favors for the ladies. Tickets for the Dinner Dance, at $7.50 per person, may be obtained from Chas. T. Nuzum, 3284 Vittmer Ave., Cincinnati 38, Ohio.

The **DAYTON BRANCH, A.E.S.,** will hold its **ANNUAL EDUCATIONAL SESSION AND DINNER DANCE** on Saturday, April 18, 1953 at the Dayton Biltmore Hotel.

The Educational Session will begin at 1:30 P.M. and will feature the following speakers:

1. "Destruction of Cyanide Wastes by Hot Electrolysis," by R. W. Oyler, Guide Lamp Division, G.M.C., Anderson, Indiana.

Perhaps YOU WERE NOT YET BORN

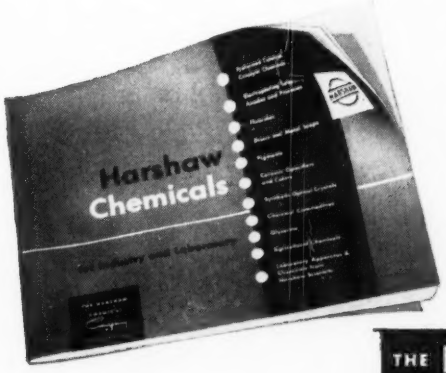


when Harshaw first produced plating materials

Then again, perhaps you plated with Harshaw nickel as far back as the year 1898 . . . when we started producing for the plating industry.

If you are an old-timer, then you know first-hand the dependability of Harshaw plating materials. And you know how often Harshaw has been **FIRST** with important new developments . . . For instance, back in the 20's when our discoveries brought "rolled depolarized and rolled carbon" nickel anodes, and in 1934 when Harshaw developed "Nibrite," the first *bright* nickel. Harshaw installed the first commercial bright electroplating bath in 1935.

That was a famous first, as you will recall. Of equal importance, too, were our introductions of fine crystal single nickel salts, and Perflow, the first truly leveling nickel deposit.



If you're a youngster, well then you should know more about us, and for that reason we have prepared a 16-page booklet which tells all about us — how thoroughly we serve the plating industry, and other major industries such as ceramic, petroleum, metalworking, paint, and others as well. Write for this free booklet. We'll be happy to send it.

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BRANCHES IN PRINCIPAL CITIES

2. "New Developments in the Plating Rectifier," by S. Mitwol, Bart-Messing Corporation, Belleville, N. J.

3. "Adhesion of Electrodeposits and New Methods of Cleaning and Oxide Removal," by Hubert M. Goldman, Enthone, Inc., New Haven, Conn.

The Dinner Dance will be held at 7:00 P.M., also at the Biltmore.

Information regarding tickets or reservations may be secured from R. L. Ruleff, Librarian, 540 Brookfield Rd., Dayton 9, Ohio.

The **BOSTON BRANCH, A.E.S., 17TH ANNUAL TECHNICAL SESSION AND BANQUET**, will be held April 18, 1953, at the Hotel Statler, Boston.

The Educational Session will be held in the Bay State Room, beginning at 1:30 P.M. The speakers and their subjects are as follows:

1. "Plating from Fluoborate Solutions," by Clifford Struyk, technical service-engineer, General Chemical Division, Allied Chemical and Dye Corporation, New York, N. Y.

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CARLSTADT, NEW JERSEY

2. "Adhesion of Electrodeposits & New Methods of Cleaning and Oxide Removal," by Dr. Walter R. Meyer, president & research director, Enthone, Inc., New Haven, Connecticut.

3. "Chromate Coatings," by H. C. Irvin, president, Allied Research Products, Inc., Baltimore, Maryland.

The Banquet will be held in the Grand Ballroom at 7:00 P.M.

The **ELEVENTH ANNUAL EDUCATIONAL SESSION AND BANQUET** of the **ROCKFORD BRANCH, A.E.S.,** will be held Saturday, April 18, at the Faust Hotel, Rockford, Illinois.

The Educational Session will be held at 1:30 P.M. in the Levin Faust Room, and will feature the following papers:

1. "Prefinishing of Steel," R. W. Redmond, process engineer, Oldsmobile Div., G.M.C., Lansing, Michigan.

2. "Die Castings for Electroplating," Merle Young, plating superintendent, Electric Auto-Lite Corporation, Woodstock, Illinois.

3. "Porosity of Electrodeposited Metals," Dr. Henry Brown, technical director, Udylite Corporation, Detroit, Michigan.

Banquet will begin at 7:00 P.M. in the Grand Ballroom. Tickets, at $5.00 each, may be obtained from E. J. Budden, 122 Twelfth St., Rockford, Illionis.

The **ANNUAL EDUCATIONAL SESSION AND DINNER DANCE** of the **INDIANAPOLIS BRANCH, A.E.S.,** will be held April 25, 1953, at the Antlers Hotel, Indianapolis, Indiana.

The speakers, and their subjects, for the Educational Session, are as follows:

1. "Electropolishing of Metals," by Malcolm Fogg, Globe Chemical Co., Cincinnati, Ohio.

2. "Manodizing," by Walter R. Lockwood, Hanson-Van Winkle-Munning Co., Matawan, N. J.

3. "Protective Finishes," by J. T. Irwin, Promat Division, Poor & Co., Waukegan, Illinois.

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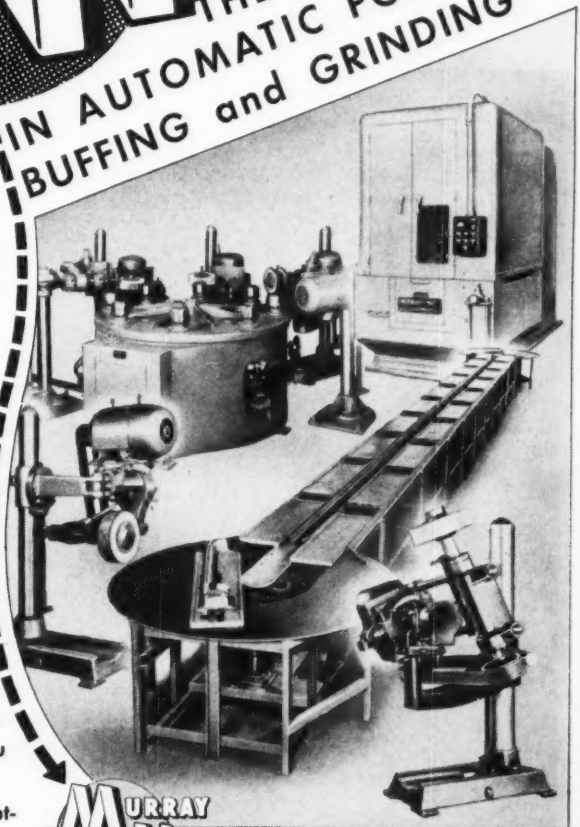
POLISHING HEADS–that top the field for versatility and efficiency.

For combined top technical knowledge and finest equipment, for your metal surfacing operations, you can't beat Murray-Way.

Your inquiries will be promptly answered.



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POST OFFICE BOX 180 – BIRMINGHAM, MICH.
AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

A. E. S. 40th ANNUAL CONVENTION, Benjamin Franklin Hotel, Philadelphia, Pa., June 15 to 18, 1953.

The **MILWAUKEE BRANCH, A.E.S.,** will hold its **ANNUAL EDUCATIONAL MEETING** on April 25, in the form of an all-day program based on the theme, "Plating of the Future."

The members and guests will meet at 9:00 A.M. for a tour of the new electroplating plant of Cutler-Hammer, Inc.

At 11:30 A.M., at the annual luncheon, Clyde Kelly, A.E.S. 3rd vice president, will speak on "The Future of the American Electroplaters' Society."

The Educational Session, beginning at 1:30 P.M., will feature the following speakers and subjects:

1. "Plating Common Metals in Aqueous Solutions," Dr. R. B. Saltonstall, technical director, Udylite Corporation, Detroit 11, Michigan.

2. "Electrodeposition of Less Common Metals from Aqueous Solutions," R. Scott Modjeska, director, Scientific Control Laboratories, Chicago 7, Illinois.

3. "Electrodeposition of Uncommon Metals in the Future," Dr. Abner Brenner, head, Electrodeposition Section, National Bureau of Standards, Washington, D. C.

The program for the **40TH ANNUAL A.E.S. CONVENTION,** to be held under the sponsorship of the **PHILADELPHIA BRANCH,** is being directed by Dr. Samuel Heiman with the assistance of the various committee chairmen shown in the photograph below.

The technical program is being arranged by Educational Committee Chairman Fred Fulforth. Edwin F. Ottens, branch exhibit chairman, has distributed to each branch secretary information pertaining to the branch exhibits and awards.

The 1953 Convention Outing being arranged by Outing Chairman Brooks Ricca, will be a chartered boat ride on the

40th AES Convention Committee Chairmen: Standing, left to right: William H. Trusdell; Albert Hirsch; Charles J. Wilmore; Clarence E. Boerkel; Edwin F. Ottens; Nat. Verrelle; Alfred H. Pope; George M. Long. Seated, left to right: Norman H. Miller; Thomas M. Rodgers; D. Gardner Foulke (A.E.S. Executive Secretary); Samuel Heiman; Delmar R. Robson; Frederick Fulforth; I. William Marcovitch. Not shown in this picture: Mrs. D. R. Robson; Harry L. Hovis; C. Brooks Ricca.

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PAYS FOR ITSELF

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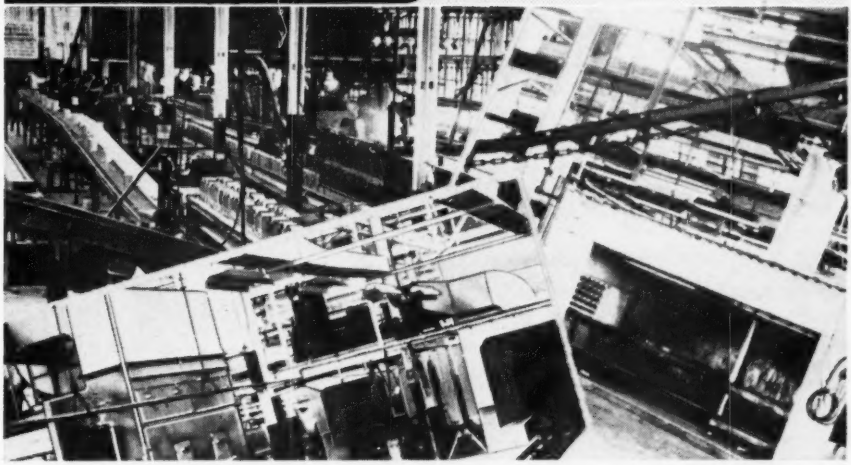

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Delaware River. The Wilson Line's new "Delaware Belle" has been chartered for the exclusive use of the members and guests of the A.E.S. Convention. The boat may be boarded just a few blocks from the Benjamin Franklin Hotel (headquarters hotel). The boat ride will enable the visitors to see Chester, Marcus Hook, and Wilmington as the boat proceeds down the Delaware River and makes the return trip in the late afternoon.

The Ladies' Program being arranged under the direction of Ladies' Committee Chairwoman, Mrs. D. R. Robson, includes a tea and entertainment at Wanamaker's, the annual supper dance sponsored by the Metal Finishing Suppliers' Association, the "Aunt Ella" luncheon at the Drexelbrook Inn followed by a visit to the famous Du Pont Longwood Gardens, and many other events of interest.

SOCIETIES

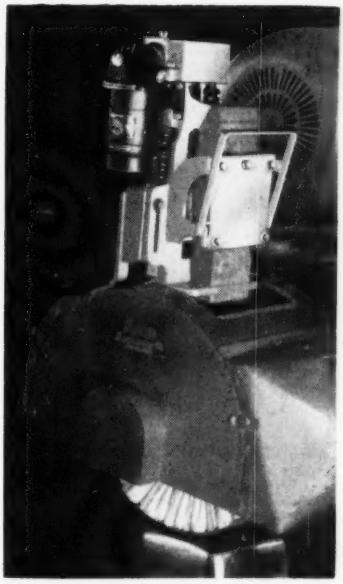
Reviewing progress in pollution abatement in the area embraced by the **OHIO RIVER VALLEY WATER SANITATION COMMISSION**, E. Blackburn Moore, chairman, told the representatives of the eight-state compact agency meeting that facilities serving almost a million people were either completed, under construction or approved to move into the construction stage during the past year.

Mr. Moore summarized the significant changes in the municipal sewage-treatment picture and pointed out that the progress provided evidence that the eight states in the Ohio River Valley were living up to their pledge of cooperative action. He called for stronger emphasis on clean-up action by communities and industries on the main stem of the Ohio River.

The **41ST ANNUAL EDUCATIONAL SESSION** of the **CHICAGO BRANCH, A.E.S.**, held January 31, at the Conrad Hilton Hotel featured talks on "Recent Developments in Precious Metal Plating" by Myron B. Diggin, Hanson-Van Winkle-Munning Company; "Prefinishing of Steel" by R. W. Redmond, Oldsmobile Div., G.M.C.; and "Development of Modern Organic Finishes" by Dr. Charles G. Moore, Nubian Division, Glidden Company.

Mr. Diggin devoted most of his time to a discussion of silver plating, pointing out that silver plating dates from 1838 and that the first patent was issued in 1840. He discussed many applications of silver plating and also furnished interesting facts about palladium plating, gold plating, and rhodium plating. To illustrate his talk he prepared an interesting display of a number of articles silver plated by means of Hanson-Van Winkle-Munning's Silver-Lume process.

ROBERT A. EMMETT, former president of the Detrex Corporation, Detroit, manufacturer of industrial and drycleaning equipment and chemicals, is shown (left) admiring a watch given him recently upon completing 30 years of service with the company. A. O. Thalacker, right, new Detrex president, gave the award to Emmett, who was elected chairman of the board.



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You'll save labor because Nankervis compound applicators are completely automatic. Costly wheel tender's time is eliminated. You'll save on compound and buffs because just the right amount of compound is applied. And you'll cut down rejects with uniform application of buffing compound. It can add up to a savings of 40% of your buffing costs!

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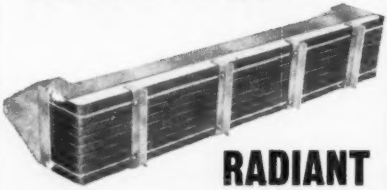

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Flat Surface Oven

Cut production time and costs on baking, heating or drying processes. Light weight — compact — easy to install.

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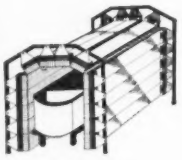

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Thin, strip type element design insures a flat, uniform, continuous heating pattern.

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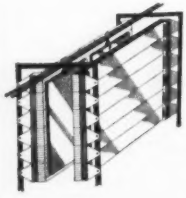

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Mr. Redmond discussed the present trend toward polishing of steel prior to forming and mentioned several of the types of polishing machines currently in use. He then discussed in some detail

J. M. Andrus, librarian of the Chicago Branch and program chairman for the 41st Annual Educational Session welcomed the members and guests to the Educational Meeting. Shown at Mr. Andrus' left are: Dr. Charles G. Moore, R. W. Redmond and Myron B. Diggin. The exhibit of silver plated ware can be seen in the foreground directly in front of the speakers' stand.

improvements which have been made in the polishing process, illustrating his remarks with slides showing the results of profilometer measurements of polished surfaces.

Dr. Moore discussed the various elements of organic finishes and described some of the changes or trends in finish manufacture.

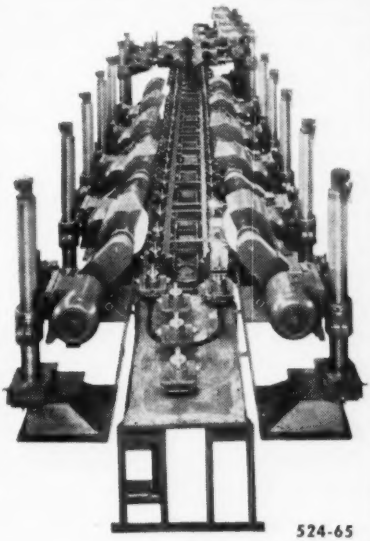
Well over 1,000 members and guests enjoyed the banquet and entertainment program which followed the Educational Meeting.

At the **ANNUAL OPEN MEETING** of the **NEW YORK BRANCH, A.E.S.**, held February 14 at the Hotel Statler, Peter Stevens, Kenmore Metal Products Corporation, discussed "Economic Advantages of Preplated Wire" describing the ways in which plating prior to forming or fabricating could be advantageous to manufacturers.

C. F. Nixon, General Motors Research Department, A.E.S. past president, in answering the question, "What is Quality?" described the General Motors' inspection program which involves the inspection of plating on General Motors' and other cars over the United States.

The ACME HORIZONTAL RETURN TYPE STRAIGHTLINE

. . . a versatile automatic Polishing and Buffing Machine easily adaptable to a wide variety of work . . .



The overhead view shown is an ACME 60-ft. Horizontal Return Type Straightline equipped with 16 ACME Type G-3 heavy duty adjustable floating head polishing and buffing lathes and universal indexing fixtures and adapters. It is used for nickel buffing toaster bodies.

This type straight line is available in various lengths from 20 feet to 60 feet or more. A 10 ft. drive section and a 10 ft. chain take up section comprise the basic 20 ft. machine which will handle 4 buffing heads. Length is easily increased by adding interchangeable 10 foot sections each allowing room for 4 additional buffing heads.

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For recommendations, send blue prints of part or samples before and after finishing, with detailed information on finishing operations and production requirements. If production methods will cut your costs, we can set your job up in our experimental processing department and you can inspect it in operation.

ROTARY STRAIGHT LINE SEMI-AUTOMATIC AND SPECIAL *Polishing and Buffing Machinery*

SPECIAL MACHINERY AUTOMATIC BUFFING MACHINES

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Builders OF AUTOMATIC POLISHING AND BUFFING MACHINES FOR NEARLY HALF A CENTURY

The data thus collected show the condition of plated automobile parts after various periods of service under the different conditions found in the various geographical locations. The information thus furnished can serve as a guide to General Motors process engineers in formulating finish specifications.

In his talk "What of Tomorrow?" Dr. Louis Weisberg, consultant, offered the New York Branch members and guests his opinion that nickel would continue to be difficult to obtain and suggested that future investigations made to develop a satisfactory chromium finish be conducted with that idea in mind. Dr. Weisberg's suggestion as to one possibility for future research was that a thicker coat of chromium plate be studied. He pointed out that the many developments made in nickel plating have come principally because of the vast amount of research work performed on nickel plating solutions during the past thirty years. He offered the opinion that an increased amount of investigation of the possibilities of chromium plating might be equally productive.

Following the Educational Session approximately 500 members and guests enjoyed an excellent dinner and entertainment program.

Fig. 1—A.E.S. President Franklyn J. MacStoker made a brief address at the Educational Session. Shown at the left is Peter Veit, Farrand Optical Company, librarian of the New York Branch, who presided over the Educational Program.

Fig. 2—John E. Sterling (center) member of the Board of Managers, New York Branch, and A.E.S. founder, past president and honorary member, is shown here requesting information from George Schore (left) secretary-treasurer of the New York Branch. Albert Fusco and Angelo Amatore (behind Mr. Sterling) served as general chairman and co-chairman, respectively, for the 1953 Annual Meeting.

Fig. 3—(Left to right) Al Korbelak, editor of "Plating"; Dr. George P. Swift, A.E.S. first vice president; C. F. Nixon, A.E.S. past president; and Angelo J. Amatore, New York Branch president.

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A. E. S. 40th ANNUAL CONVENTION, Benjamin Franklin Hotel, Philadelphia, Pa., June 15 to 18, 1953

Philip Ranno

PHILIP RANNO of the Imperial Plating Company, Brooklyn, New York, was elected chairman of the Masters' Electroplating Association at the annual meeting of the Executive Committee. Mr. Ranno is also President of the National Federation of Metal Finishers. He has been in the plating business for 23 years.

The other officers of the Executive Committee are Irving Berkman, treasurer, Berkman Brothers; Joseph F. Brust, Brust Brothers, Inc.; Alfred D'Agostino, Albert Plating Works, Inc.; John Forbath, Star Chromium Corp.; Jesse Goldman, Grand Chromium Plating Co.; Frank Kaiser, Long Island Mechanical Plating Co., Inc.; Samuel P. Levy, R. Plumacher & Sons, Inc.; Julian Nelkin, Henry Nelkin, Inc.; Sal Novelli, Service Plating Co.; and Philip Sievering, Philip Sievering, Inc.

meetings OF INTEREST TO FINISHERS

Mar. 16-20. Ninth Annual Meeting, National Association of Corrosion Engineers, Hotel Sherman, Chicago, Ill. Protective Coatings Symposium.

Mar. 19-20. Annual Meeting, American Hot Dip Galvanizers Association, Cincinnati, Ohio.

Mar. 23-27. American Society for Metals, Western Metal Congress and Exposition. Los Angeles, Calif.

Mar. 28. Cincinnati Branch, A.E.S., Annual Educational Session and Dinner Dance, Hotel Gibson, Cincinnati, Ohio.

Mar. 31-Apr. 2. First International Magnesium Exposition, National Guard Armory, Washington, D. C. Sponsored by the Magnesium Association.

Apr. 13-14. International Association of Electrotypers and Stereotypers, Inc., 1952 Spring Conference, Hotel William Penn, Pittsburgh, Pa.

Apr. 18. Annual Technical Session and Banquet, Boston Branch, A. E. S., Hotel Statler, Boston, Massachusetts.

Apr. 18. Dayton Branch, A.E.S., Annual Educational Session and Dinner Dance. Biltmore Hotel, Dayton, Ohio.

Apr. 18. Rockford Branch, A.E.S., Eleventh Annual Educational Session and Banquet, Faust Hotel, Rockford, Ill.

Apr. 25. Milwaukee Branch, A.E.S., Annual Educational Meeting.

Apr. 25. Indianapolis Branch, A.E.S., Tenth Annual Educational Session and Dinner Dance, Antlers Hotel, Indianapolis, Indiana.

Apr. 26. A. E. S. Thirteenth Regional Meeting, Hotel Taft, New Haven, Conn.

Apr. 27-28. 29th Meeting, The Galvanizers Committee, American Zinc Institute, Hotel Statler, St. Louis, Mo.

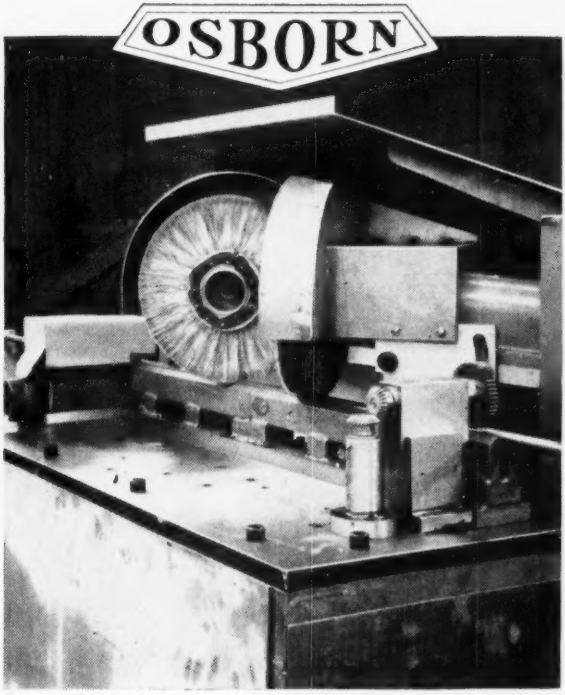
May 9. A.E.S. Ninth New England Regional Meeting, Kimball Hotel, Springfield, Mass.

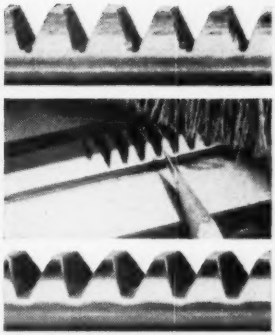
Jun. 15-18. American Electroplaters' Society, 40th Annual Convention. Benjamin Franklin Hotel, Philadelphia, Pa.

June 29-July 3. ASTM Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

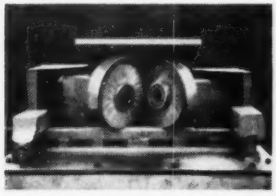
Sept. 21-25. Eighth National Instrument Exhibit, Instrument Society of America, Sherman Hotel, Chicago, Illinois.

OSBORN





BEFORE AND AFTER. Top view shows closeup of rack teeth with light burrs and rough surface before brushing by new "push-button" method. Center view shows closeup of rack in machine after completion of brushing. Bottom view shows teeth after brushing. Note uniform surfaces and smooth finish on all teeth.



HOW IT'S DONE. Two rotating Osborn power brushes, engage rack teeth at angles as shown. At push of button rack drives through machine at about 5 ft. per minute. When the rack completes passage, the drive reverses and sends it back in the other direction. On return travel of part, the direction of brush rotation is reversed to contact surfaces on the opposite side of rack. This gives both sides of teeth uniform brushing.

Formerly 50 minutes...
Now brush-deburred in 6 minutes

8 times as fast... more uniform deburring... finer surface finish. These are the advantages gained by a large machinery manufacturer with an automatic power-brushing method. The part: a rack gear, 17 ft. long with more than 1000 teeth. The job: light deburring of machine-cut teeth, and blending the junctures of intersecting surfaces to form smooth curves in place of fragile, sharp edges.

With the help of their **O**sborn **B**rushing **A**nalyst, they devised the machine shown above. This automatically controlled machine with two heads of Osborn Fascut brushes does the entire job in 6 minutes. Burr removal and surface juncture blend are far superior to former methods.

This is typical of thousands of cases where production is being vastly improved with Osborn power brushing methods. Find out how you can cut *your* costs! Call in your **OBA** today or write *The Osborn Manufacturing Company, Dept. O-3, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

WHAT'S YOUR PROBLEM? The nearby Osborn Brushing Analyst is experienced in working with machine designers and methods engineers to solve problems with the latest power brushing techniques. Feel free to call him for help!

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9 models
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Save up to 15% in time

Pump or spray "heavy" materials—like sound deadeners, buffing compounds, rust preventatives, gear lubricants, etc.—directly from the original container by using a Binks Material Handling Pump. You save up to 15% in handling time alone.

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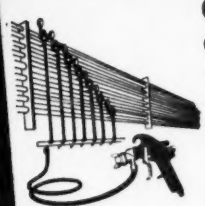
SPRAY BOOTHS

MATERIAL TANKS

PAINT CIRCULATING SYSTEMS

Get identical finishes at each station



PAINT CIRCULATING SYSTEMS
same finishes every time

Each spray station in the plant gets *exactly* the same paint at *exactly* the same pressure when you use a Binks Paint Circulating System. Paint circulates from a central mixing room, giving you rigid control of color and viscosity. The operator cannot change the material pressure. Identical finishes are a certain result.

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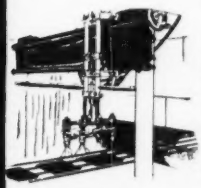
Cut finishing costs automatically



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lowers production costs
improves finish quality

On *flat* surfaces, use Binks Model 7R Spray Guns. Mechanical arms sweep the guns back and forth across products like wallboard, tile, glass, table tops, range parts, etc. On *round* or *multi-sided* products, use Binks Model 21 Guns for automatic finishing inside and/or outside. Ideal for such products as vehicle wheels, golf balls, appliances, etc.

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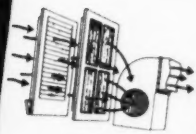
Stop dirt marring your finishes



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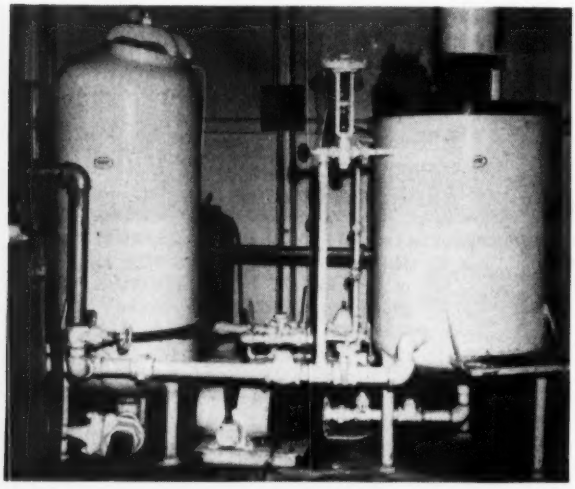
Tank Type Pressure Filter

A new tank-type pressure filter has been introduced by the Ogden Filter Company, 4214 Santa Monica Blvd., Los Angeles 29, Calif., for the filtering of chemicals, electroplating solutions, oils, the recovery of wastes and treatment of waste water. Said to eliminate all cloths, papers, screens and pads, the Ogden unit ensures controlled quality filtration and higher flow rates.

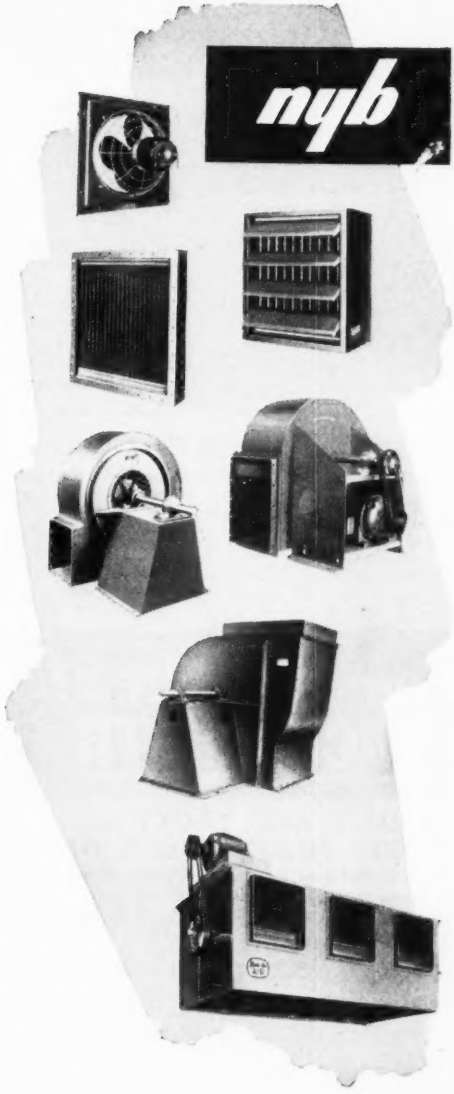
The manufacturer points out that special construction of the Ogden Filter, engineered after years of research, accounts for its remarkably efficient performance and superiority. A series of synthetic, rigid porous stone membranes, upon which the filter aid coating is deposited, provide a perfect retaining surface for the formation of a controlled clarity filtration, and allow a fast and thorough backwash.

The use of diatomaceous silica supplies desired clarities at exceptionally high flow rates. Complete cleaning and even sterilization of the filter can be accomplished without opening the chamber. A patented tank closure permits the unit to be opened for inspection or adjustment by the release of just two bolts.

Ogden Tank Type Pressure Filters are available in all capacities in all metals and alloys as well as plastic or rubber lined to meet specific problems.



Tank Type Pressure Filter



Announces

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No. 76 and No. 91

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SLOW SPEED WHEEL
ADJUSTABLE AIR DELIVERY

Capacities from 400 to 1400 cfm

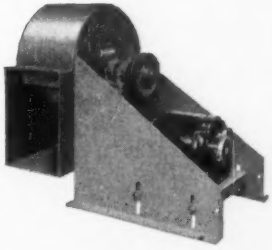
Developed to meet popular demand for a small, adjustable speed V-belt fan, which is quiet in operation and where fan speed can be adjusted in the field.

CAST ALUMINUM SLOW SPEED WHEEL is ideal to meet requirements of small ventilating problems such as exhaust from private offices, washrooms, laboratories, where quiet operation is demanded and precise quantities of air are to be handled. In order to use the Slow Speed wheel for this service, belt driven units are necessary.

V-BELT DRIVES have adjustable motor sheave giving speed adjustments of 30% to 50% depending upon the motor selected.

RUGGED CONSTRUCTION · Realizing that quiet fan operation requires sturdy construction, the same type all-welded steel housing is used as in the larger ***nyb*** ventilating fans.

Write for Bulletin 530



nyb **THE NEW YORK BLOWER COMPANY**

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Portable Gear Head Mixer

Standard Electric Mfg. Co., Inc., West Berlin, N. J., has developed a portable 1/3 h.p. gear head mixer specially designed for mixing either more viscous liquids or larger quantities of less viscous liquids. A ¾-inch diameter, 48-inch long stainless steel shaft is removable and interchangeable with other size shafts to fit individual requirements. In addition, the two 7-inch stainless steel deep pitch propellers, furnished as standard equipment, can be replaced with 8, 10 or 12-inch cast iron or aluminum propellers. The adjustable clamp permits adjustment of the mixer to any angle and to any shape tank.

Portable Gear Head Mixer

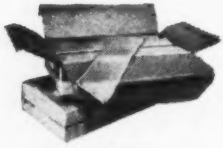
The Portable Gear Head Mixer is equipped with a 1,750 r.p.m. motor. Propeller speed is 432 r.p.m. obtained through the special Standard Electric gear head adapter. Ball bearing mounted, the mixer is designed to withstand rotating loads and prevent shaft whip. Dual voltage of 110 or 220 volts is another added feature.

Labline Radiant Wall Oven

A radiant wall electric laboratory oven, announced by Labine, Inc., 217 N. Des-Plaines St., Chicago 6, Ill., features a special hydraulic thermostat with fully enclosed "walking" contact points, special Marinite heat barrier and 3-inch thickness of glass wool insulation, full

For Dust Free Finishes!
BOND TACK CLOTH

IN ROLLS
Cut off any size piece to use as needed.



IN BULK
Cut and folded. Ready to use.

STAYS SOFT AND TACKY — A SPECK-FREE FINISH EVERY TIME

Now Available in Rolls or Cut Bulk—White or Gold In Three Different Types of Cloth

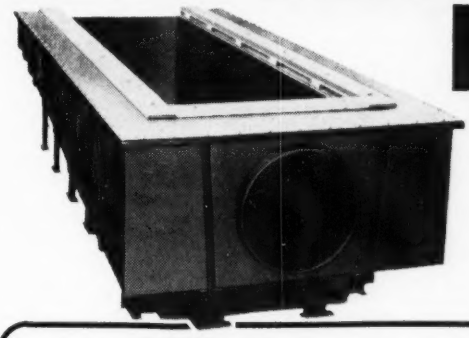
Get your Tack Cloth packed just the way it's easiest for you to use . . . either in 150 yard rolls of 36" wide cloth or in handy cartons . . . 100 or more Tack Cloths to the carton.
No matter which way you buy it, you can be sure that every square inch will stay SOFT and TACKY until the very last bit is used up!
The Cut Bulk size is 18" x 36" . . . folded to 4½" x 18" for ease of handling. ALL BOND TACK CLOTH is *Spontaneous Combustion Proof, Lint-Free* and *Wax-Free*. Gives a sparkling speck-free Finish *every time*. Clean and sanitary. No waste.

TRY THEM and COMPARE RESULTS. Samples Gladly Sent Upon Request.

BOND CHEMICAL PRODUCTS CO.
"The Tacky Wiper Specialists"
2639 N. CLYBOURN AVE. CHICAGO 14, ILLINOIS

ALSO INDIVIDUALLY PACKED IN GLASSINE ENVELOPES —144 to the Carton

A WARRANTY OF SATISFACTION IN EVERY CARTON



TANKS

HAVEG

CUT COSTS...RESIST CORROSION WITH HAVEG PICKLING TANKS

Tanks and fume systems of corrosion-resistant Haveg offer a permanent answer to your need for long-life, maintenance-free pickling equipment. This unique plastic is molded into large and small tanks, fume ducts and hoods, parts for circulating picklers. Since it is not a lining or coating, and possesses uniform resistance to corrosion, Haveg belongs in your system.

Learn all the facts about Haveg! *Write today for 64-page Bulletin F-6.*

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Factory capacity has been increased. Deliveries are getting much better!

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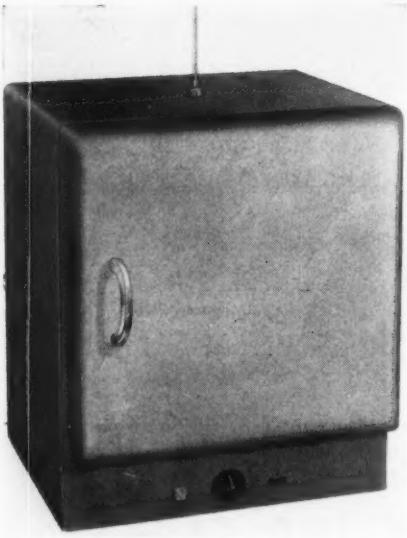
HARTFORD 5	HOUSTON 4	LOS ANGELES 14	SEATTLE 7
86 Farmington Ave.	4101 San Jacinto	523 W. Sixth St.	5600 14th Ave. N.W.
Hartford 6-4250	Jackson 6840	Mutual 1105	Hemlock 1351



Labline Radiant Wall Oven

length piano-type door hinge, and a double walled metal cabinet. The oven is designed for temperature range of from room temperature to 200 deg. C. (392 deg. F.).

The oven is available in two sizes with interior dimensions 13 by 13 by 13 inches and 18 by 20 by 17½ inches. Bulletin 3500 issued by the company describes the Labline ovens completely.

Submerged Plating Barrel

The Hanson - Van Winkle - Munning Company, Matawan, N. J., has announced submerged barrel plating equipment which completely immerses the plating barrel in the electrolyte. All surfaces of the work receive a uniform solution bath because no part of it can be exposed to the air while tumbling. The completely submerged barrel is claimed to permit greater current density and thus enable faster plating.

The new equipment includes both barrel and plating tank. The barrel is hexagonal in shape and has an inside diameter of 14 inches. Barrels are available in 30 and 36 inch lengths, having approximate capacities of 125 and 110 pounds respectively.

Plexiglas barrels are recommended for all-round use in solutions up to 180 deg. F. Melamine is recommended for use in solutions up to 210 deg. F. Plexiglas barrels have 1 inch thick heads and ½ inch panels; Melamine barrels have 1 inch thick heads and ¼ inch panels with rib reinforcement.

The barrel is suspended in the plating solution on hanger arms which form an integral part of an angle-iron frame which transverses the top of the tank. Frame contact pins fit into tank saddle brackets and provide electrical contact between bus bars (on which saddles are mounted) and barrel heads (equipped with flexible dangler contacts).

Tanks are constructed of ¼ inch double electric-welded steel. The drive motor, including speed reducer, is mounted on a shelf at one end of the tank. Tanks are painted with rust-protective gray enamel and trimmed with black. Each tank has a 2 inch drain at the bottom and has space for mounting two heating or cooling coils. Special vulcanized-rubber or koroseal-lined tanks are available for use with acid solutions. Cast iron hanger arms and gears can be supplied for cyanide solutions. Rubber-covered cast-iron hanger arms and plastic gears can be ordered for acid immersion.

Solvent Phosphating Cleaner

A new solvent phosphating cleaner known as "Solo-Phos" (patent pending) is said to be a three-in-one cleaner. It removes grease and tar, cleans off chips and forms a rust-inhibitive phosphate coating.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* **4316 Paul St., Phila., Pa.**

Solo-Phos was developed by the Whitfield Chemical Co., 14225 Schaefer Highway, Detroit 27, Mich., manufacturer of industrial metal cleaning chemicals and processes.

Used for one-step cold cleaning and phosphatizing of ferrous metals, aluminum and zinc, it reacts with organic or metallic soils. It has a high solvency for oil, grease, and tar and the rust-inhibitive film formed on metal surfaces makes an ideal base for painting, it is claimed.

Solo-Phos can be applied in concentrated form by spraying, flushing, or dipping. Only standard equipment is necessary. After being allowed to react, it should be spray rinsed. Diluted solutions of Solo-Phos can be used hot or cold in tank or hand washing applications.

This cleaner was developed primarily to be used on parts where heat is not available. It will not attack rubber-tired wheels, painted or plated surfaces, and may be applied over plastic coated parts.

Duroplastic Tanks

A line of tanks, hoods, ducts, and containers fabricated from a laminated resin-bonded glass fiber reinforced plastic material has been announced by Duroplastic Tanks, 376 Washington St., Malden, Mass.

Claimed for the products are high resistance to impact, heat, acids, bleaches, solvents,and plating solutions, low absorption of solution ingredients and design features which ensure adequate strength at corners and other points of strain.

The manufacturer points out that Duroplastic tanks are light, economical, and can be used for plating solutions, various kinds of acids, and other solutions generally used in plating and finishing processes.

A wide variety of standard size tanks are available as well as ventilating hoods and pipe. Welding kits to provide facilities for simple field connections of ducts, pipe and fittings are available from the manufacturer.

Pocket Calculator and Buffing Guide

Termed by the company, "the ideal buffing guide for shop foremen," a Pocket Calculator and Buffing Guide is offered free on request by American Buff Company, 2414 S. LaSalle Street, Chicago 16, Ill., manufacturer of a wide line of cen-

KEEP SPRAY BOOTHS SAFER FROM FIRE!

WITH NON-INFLAMMABLE

BOOTHCOTE #4

FOR DRY WALL BOOTHS

PERFECT LUBRICANT FOR FORMS

BOOTHCOTE #5 FOR WATER WASH BOOTHS

PERFECT RUST PREVENTATIVE

INSIDE STORAGE—OUTSIDE STORAGE

Makes frequent cleaning easy. Pre-mixed, ready to use, safe to store. Saves time, labor, no flaking off. Spray or brush on clean booth. When desired, operator peels off overspray in sheets. Advocated by insurance companies.

MONEY-BACK TRIAL OFFER: 5 gals. $6.25

KLEENCOTE WATER WASH COMPOUND

BREAKS UP PAINT—NO CLOGGED UP SYSTEMS

HYGRADE'S STERLING CREME

HYGRADE'S SKIN GUARD

protects hands, face and arms from paint, grease, ink, etc. penetrating skin. Soil washes off easily without harsh solvents or cleaners. Paint and grime washes off. Reduces blackheads and skin blemishes. 12 — 7 oz. Jars — $6.00

HYGRADE'S STERLING CLEANER

HYGRADE'S HANDY SOAP & CLEANER

(WATERLESS HAND CLEANER)

dissolves grease, grime, fresh paint, tar, printers' ink, shellac, mastic cement, etc. without water. Use for cleaning refrigerators, ranges, etc., before shipping. 12 — 14 oz. Jars — $7.08

All prices f.o.b. Buffalo

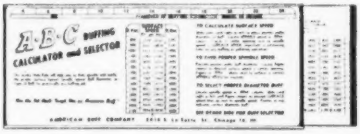
HYGRADE

FOOD PRODUCTS CORP.

Industrial Div., 18 Stetson St., Buffalo 6, N. Y.

terless and other automatic bias buffs. Designed for quick, easy reference, this handy tool is simple to use, small and compact to fit shirt or coat pocket.

Simple directions printed right on the brightly-colored plastic case make fast, accurate buffing decisions possible on all types of jobs. Slide-rule operation answers such questions as: what type of buff is required for polishing aluminum die-castings; what diameter wheel produces a certain surface speed, and so on.



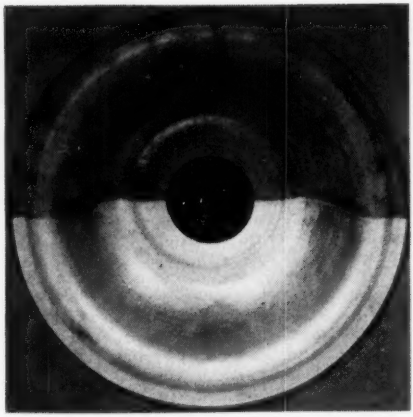
Pocket Calculator and Buffing Guide

It helps shopmen find the right buff, the right size, the right speed for every buffing job.

Enthone DESCALER 2A

Enthone, Inc., Dept. PF, 442 Elm Street, New Haven, Conn., has announced Enthone DESCALER 2A for rapid removal of oxide and scale from steel. The product is acidic in nature and is available in a dry powder form. It is used in concentrations ranging from one to several pounds per gallon with temperatures ranging from 70 to 180 deg. F. depending upon the speed of descaling desired and the type of scale. It is stated that this compound enables controlled pickling with a minimum of attack on the base metal.

The product contains surfactants to dislodge oil films, to promote faster pickling and to give white clean surfaces after descaling or derusting. The manufacturer states that the product is ideal for tumble or barrel derusting or descaling. It is also used for removal of rust or scale in vats or tanks, for primary pickling or for plating cycles. A layer of foam forms on the pickling solution, practically eliminating fumes and reducing corrosion on surrounding equipment.



Heavily rusted and scaled steel, the lower portion of which has been pickled by Enthone Descaler 2A and which now exhibits a clean, bright surface.

CHEMSTEEL CONSTRUCTION COMPANY, INC.
301 Chemsteel Bldg., Walnut St., Pittsburgh 32, Pa.

Send data on Engineering & Construction facilities for
ACID-ALKALI-PROOF CONSTRUCTION
of processing & storage tanks & flooring in
☐ Steel Plant ☐ Chemical ☐ Textile ☐ Food

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Brady Quik-Masks for Anodized Metals

The W. H. Brady Company, Dept. 403, 1640 E. Spring St., Chippewa Falls, Wis., manufacturer of self-sticking industrial products, has announced the addition of a new line of QUIK-MASKS developed specifically for use on anodized surfaces.

The material used for these Brady masks is Minnesota Mining and Mfg. Company's No. 241 paper masking tape. This tape has recently been developed by 3M to meet the demands of the painting and plating industry for a tape that adheres to anodized surfaces during high temperature baking cycles. It is easily removed after baking, the supplier states.

Anodized metal parts, such as castings, are frequently painted after being anodized. Certain areas must be protected from paint. Brady QUIK-MASKS provide this protection because they are pre-cut to the exact size and shape of the area

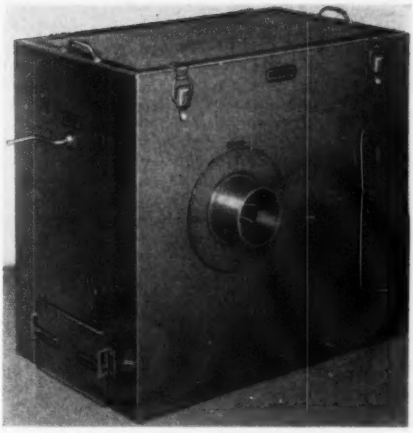
that must be protected.

The principal applications for this line of QUIK-MASKS are on anodized aluminum, pickled magnesium, dichromated magnesium and similarly treated metal surfaces. The anodized areas to be protected from paint are first masked, paint is applied and then the entire part is baked. Baking temperatures for painted anodized metals are frequently in excess of 400 deg. F.

Brady QUIK-MASKS stick to anodized metal surfaces without moistening, and may be removed easily following the baking cycle, it is claimed.

Small Dust Collector

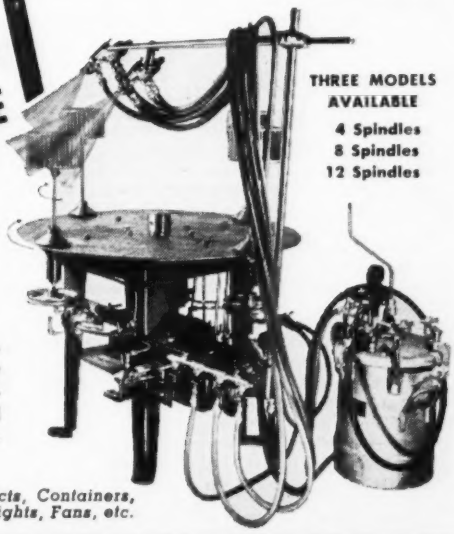
Identified as the "Dustkop" Model 520, a self-contained dust collector specially designed for remotely located dust sources such as grinders, polishers, sanders, buffers, and so on, has been announced by Aget-Detroit Co., 207 Main St., Ann Arbor Mich. The unit requires a floor space of 18 x 23 inches, has a 25-inch overall height, is said to develop a rated 525 c.f.m. at static suction of 2-inch water lift.



"Dustkop" Model 520 Dust Collector

Available with single or double inlet connections, the Model 520 has a paddle-wheel self-clearing type fan which is direct driven by a 1/3 h.p. continuous duty motor designed for operation on either

HOLLAND
automatic-pneumatic
SPRAYING MACHINE



THREE MODELS AVAILABLE
4 Spindles
8 Spindles
12 Spindles

- GIVES AN EVEN FINISH
- SPEEDS UP PRODUCTION
- IMPROVES QUALITY OF PRODUCT

This new fully automatic, portable spraying machine is activated *solely* by air pressure. Only one operator is needed to load, and remove finished and unfinished work. WRITE FOR FULL INFORMATION.

Ideal for spraying: Cans, Novelties, Compacts, Containers, Aluminumware, Electrical Appliances, Flashlights, Fans, etc.

J. HOLLAND & SONS, INC. ■ 276 SOUTH 9th ST., BROOKLYN 11, N. Y.

110-volt single-phase or 220-volt or 440-volt 3-phase 60-cycle power. A built-in separator of predetermined size and performance characteristics is said to remove dust down to 20-micron size and precipitate them into a dust storage compartment which comprises the base of the unit. The rest of the dusts are removed from the air stream by an easily renewable spun glass filter which comprises the top of the unit. A hand shaker crank permits periodic shake-down of the filter to prolong its useful life.

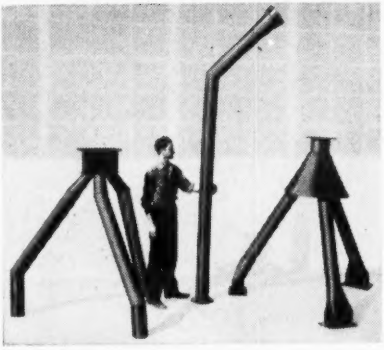
Permacel Tack Cloth

To remove dust, dirt, lint, abrasive and paint particles from the to-be-painted surface, the Industrial Tape Corporation, Highway No. 25, New Brunswick, N. J., has marketed Permacel Tack Cloth. Recommended by the manufacturer for cleaning automobiles, trucks, and buses prior to refinishing, the 18 by 36-inch tack cloths have been treated, through laboratory development, with a special impregnant which is claimed to remove all foreign material and leave no deposit from the cloth. Each Permacel Cloth is folded into a convenient hand size pad and packaged in a sealed air tight cellophane bag which keeps it soft and flexible.

Corrosion Resistant Exhaust Manifolds and Ducts

Corrosion resistant exhaust manifolds and ducts are now available in all-plastic, fully rigid construction, from the American Agile Corp., P.O. Box 168, Bedford, Ohio.

Fabricated from Agilene (Polyethylene) or Agilide (Unplasticized Polyvinyl Chloride), both of which offer excellent resistance to the corrosive action of a great number of chemical reagents, they are made to customer's specification, both of square or round design, and shipped to the site of final installation in easy to assemble sections.



Plastic Exhaust Manifolds

These all-plastic manifolds are of welded construction and can also be installed into existing duct systems.

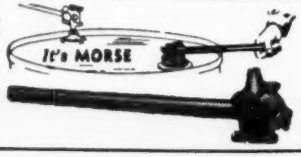
The manufacturer states that the outstanding corrosion resistance, light weight, ease of installation, and long service life of such manifolds and ducts make them an important tool in the design of exhaust systems carrying corrosive vapors.

PRODUCT LITERATURE

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

Catalog 1520, released by Minneapolis-Honeywell Regulator Co., Brown Instrument Div., Station 64, Wayne & Windrim Aves., Philadelphia 44, Pa., contains factual information concerning ElectroniK non-control precision instruments, which

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED.... **$3.00**
Non-sparking type $4.60
Plus Parcel Post
MORSE MFG. CO., Inc.
762 W. Manlius St., E. Syracuse, N. Y.

employ a potentiometer, Wheatstone bridge, or other measuring circuit to measure temperature, pressure, flow, pH and a host of other variables. Actually a handbook for engineers' and buyers' use, the literature presents detailed specifications for each particular model. Also included is information on specially adapted ElectroniK instruments such as the Electrometer, Function Plotter, Scanning System, TV Dial Recorder, Double Range Precision Indicator, and Console Desk Precision Indicator.

Trerice Temperature Instruments. Bulletin 803, covering temperature instruments for the metal finishing industry has been announced by the H. O. Trerice Company, 1420 West Lafayette Blvd., Detroit 16, Michigan.

The bulletin describes thermometers, pressure instruments, temperature controllers and steam traps. Typical plating installations are diagrammed. A portion of the booklet tells why automatic temperature control is essential to plating operations.

Nickel Immersion Coatings. A four-page review of the relative advantages and limitations of two nonelectrolytic nickel-coating processes, the displacement and the "electroless" is available from International Nickel Co., Inc., 67 Wall St., New York 5 N. Y. The processes are shown to be not competitive with each other or with electroplating. The operation of the processes, the nature of the deposits, physical properties, protective value, efficiency and potential applications are discussed. The displacement method is limited to coatings under 50 millionths of an inch on iron or steel bases and is visualized as an inexpensive way of making a superior base for other coatings. The "electroless" process is suggested where such advantages as uniform coatings or several mils to a variety of bases regardless of shape, including intricate interior surfaces, will justify the cost.

NOW... FOR THE FIRST TIME! At low cost

A Light Capacity Overhead Conveyor, fully enclosed, continuous powered.

U.S. PRODUCTS

CONTINUOUS POWERED OVERHEAD CHAIN CONVEYOR

CHAINVEYOR

Features

Simplicity—Engineered to eliminate complicated, fast wearing parts, Chainveyor is revolutionary in simplicity of design.

Track—1⅝"x ⅛" slotted steel tube easily installed with minimum support.

Chain—Full ball bearing wheels mounted on steel side links, heat-treated for long life.

Curves—15" radii provides extreme flexibility.

Take-Up—Adjustable spring take-up automatically maintains uniform chain tension.

Vari Speed Drive—Positive sprocket tooth drive with easily replaceable shear pin protection.

Capacity—30# per pendant at 6" intervals, 60# at 12" intervals when supported by 2 pendants with cross bar attachment.—up to 400# chain pull.

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If your conveyor requirement falls within its capacity—INVESTIGATE CHAINVEYOR. It is truly revolutionary in the materials handling field. Write today for full information. Dept. D

U.S. PRODUCTS

United States Spring & Bumper Co.

4951 Alcoa, Box 2475 Terminal Annex

Los Angeles 58, California

Buff Bulletin. Hanson-Van Winkle-Munning Company, Matawan, N. J., is distributing a new 12-page 8½ x 11-inch bulletin on disc-type buffs for cutting and coloring. Covering three basic types of buffs, the bulletin, designated as **Bulletin B-100,** contains 20 illustrations and 4 tables. The text tells when to use and how to specify pieced buffs, full disc buffs and the new Acme Ventilated Ruff-L-Buff. Also covered are Acme Ventilated Contact Wheel Sections used with abrasive belts.

The first section of the bulletin is devoted to technical information on heavy duty Ruff-L-Buffs. Following are two pages, four illustrations and one chart giving specifications covering which buff to use for medium-to-heavy and medium-to-light cutting, and which buff to use for color operations.

Lead-center and other jeweler buffs are tabularized according to diameter, ply, rows sewing, and thickness. Goblet buffs are also covered in the jewelers section.

Pieced buffs are classified as to grades, and specification data includes the approximate weight per section for eight different buff diameters and seven kinds of cloth.

Concluding the booklet is a technical section covering types of buff sewing—spiral sewing, concentric sewing, petal sewing, hand quilting, radial, square, and parallel sewing.

Catalog 1550—pH and Conductivity Recorders and Controllers. A 24-page catalog, produced by Minneapolis-Honeywell Regulator Co., Brown Instruments Division, Station 64, Philadelphia 44, Pennsylvania, describes and gives details on measurement and control of pH, Redox, and conductivity. Included is the easy-to-understand theory behind electrochemical measurement, and up-to-date information on recorders, controllers, amplifiers and electrodes. The catalog also contains information on where and how to use automatic pH, Redox, and conductivity measuring and controlling equipment.

PAINT MIXER
MIRACLE
5 GALLON
PAINT REJUVENATOR
All paint restored to original consistency without opening the can.
2 minutes per gallon.
MIRACLE PAINT REJUVENATOR CO.
127 E. 9th St., St. Paul 1, Minn.

Nopalcol Ethylene Oxide Condensates. An eight-page, two-color illustrated booklet issued by the Nopco Chemical Co., Harrison, N. J., describes the Nopalcol surface active chemicals produced by the company. These chemicals are used, in the finishing field, as emulsifiers, detergents, and wetting aids.

Each use or application for the products is discussed fully in the booklet. A complete chart listing the composition, appearance, and properties of the various surface active chemicals enables users of the products to select the ones particularly suited for each application.

Fiftieth Anniversary Brochure. Union Bay State Chemical Co., Inc., 491 Main St., Cambridge 42, Mass., has published a "pictorial outline" of its operation, beginning in the laboratory, continuing through production, and finally through

shipping, and including brief biographical sketches of its executives and picturing the firm's representatives, indicating their territories.

Users of latices, cements and solvents who are interested in knowing how a chemical manufacturer equips his plant and controls production will find this brochure of interest.

Pla-Tank Data Sheets. Available from The Chemical Corp., 54 Waltham Ave., Springfield 9, Mass., are various data sheets describing and listing specifications for various Pla-Tank products; tanks, pipes, ducts, and exhaust hoods. Included are a sheet of chemical resistance reports, a test report on physical properties of Pla-Tank resin-bonded fiberglas material and a resistance table for the plating room.

Demineralization and Silica Removal by Ion Exchange. To help explain one of the newer roles that ion exchangers are playing in industry, The Permutit Co., 330 West 42nd St., New York 36, N. Y., has prepared a 28-page bulletin, "Demineralization and Silica Removal by Ion Exchange."

Bulletin 3803 describes the chief applications, principles of operation, design features, advantages, recommendations and specifications of Permutit's demineralizing and silica removal apparatus and synthetic resins.

Alkaline Chlorination for Cyanide Waste Treatment. A series of five articles reprinted from "Chlorination Topics" is being distributed by Wallace & Tiernan Co., Inc., 11 Mill Street, Belleville 9, N. J. The fifth article, "Review of Articles on Chlorination of Cyanide Wastes," lists many reference works of value.

NEW
MASKING METHOD
for SPRAY PAINTING • PLATING • SAND BLASTING
PRE-CUT SELF-STICKING QUIK-MASKS

Hundreds of plants now using Brady QUIK-MASKS are saving time and money **by completely eliminating** costly hand work, use of stop-off materials and metal shields. QUIK-MASKS are **pre-cut to the exact size and shape you need.** Protect name plates, machined parts, plated and polished sections, holes, threads, etc., from paint, plating and cleaning solutions, oils, acids and sand blasting.

QUIK-MASKS are pre-cut from special "SCOTCH" brand plating and masking tapes. They stick without moistening—are quickly applied and removed. Circles, squares, rectangles, hexagons, letters and numerals stocked in many sizes. Nameplates and other specials made to your exact requirements.

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DISTRIBUTORS IN OVER 125 PRINCIPAL CITIES

MANUFACTURERS OF SELF-STICKING PRODUCTS
W. H. BRADY COMPANY

776 W. GLENDALE AVE. • MILWAUKEE 12, WIS.

Catalog 51. A four-page price list available from Schaffner Mfg. Co., Inc., Emsworth, Pittsburgh 2, Pa., manufacturer of polishing and buffing compounds, buffs, and plater's supplies, lists the products of the firm and the purpose or suggested use for each. Included is a laboratory data sheet on which requests for technical information and free samples may be indicated and returned to Schaffner.

Koch Truck & Cabinet Ovens. Cabinet ovens, drying and baking ovens, truck type ovens, and stack fans of the George Koch Sons, Inc., 2112 Pennsylvania St., Evansville 4, Ind., are illustrated and described in an 8-page folder available from the firm. Specifications are listed for the Standard and Deluxe models, electric cabinet ovens, and for the truck type ovens. One full page is devoted to the construction features and accessory equipment for Koch truck type ovens. A chart listing horsepower, diameter, revolutions per minute and so forth for Koch stack fans concludes the catalog.

Bulletin 513. The New York Blower Co., 3166 S. Shields Ave., Chicago 16, Ill., has issued an 8-page report on Comet airstream unit heater. Various charts and tables, capacities of Comet unit heaters at various entering air temperatures and steam pressures, constants for determining capacities under various conditions, estimating chart for radiation, condensed capacity table and physical data, hot water heating capacity table, and pipe sizes for two pipe gravity low pressure heating systems, are included. Pictured and described are pent houses, general purpose fans, Exhaustair propeller type fans, make-up air unit.

SCO Folder. Stuart C. Olsen, West Road, Norfolk, Conn., leather importer, sole United States agents for English Oak Tanned Walrus Leathers, has available a folder picturing and describing polishing and buffing hides. Other products of the company described in the folder are English made sheepskin wheels, polishing gloves, combing aprons, comb circles, and polishing leather bends.

Specification Booklet. Plant men concerned with defense production will find the recently revised booklet, **"Houghton Products Meeting Government Specifications"** a helpful reference in the manufacture of items to meet Federal requirements.

Houghton products meeting various specifications are conveniently listed under the following classifications: rust preventives, lubricants, cutting oils, metal working aids, and leather and synthetic rubber products.

One section of the booklet of unusual interest is the Government Preservative Compound Chart, based on MIL-P-116 A, which contains descriptive and application details of P-1 to P-17 preservatives.

Distribution of the new booklet is limited to defense plants and various federal agencies. Copies may be obtained from E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Wire Mesh Conveyor Belt Catalog. The Cambridge Wire Cloth Company, Cambridge, Maryland, has issued a new, revised catalog for its wire mesh conveyor belts.

Totaling approximately 140 pages, the new catalog gives data on uses for wire mesh belts including photos and flow sheets, selection of belt specifications, conveyor design, belt drive mechanisms and metallurgical tabular data. In many ways the new catalog can more correctly be considered a reference manual of wire mesh belt design and use since it includes more of this type of data than previous versions.

Far-infrared Specifications. Specifications of the new Chromalox electric far-infrared radiant panel are detailed in a folder issued by Edwin L. Wiegand Co., 7552 Thomas Blvd., Pittsburgh 8, Pa., for use by Federal, State, and local government purchasing agencies, and others required to purchase by invitation and bid.

The folder, designated as **L-1093**, lists twenty-four separate items, including every component part and characteristic of the panel in non-restrictive language. The modular panels are assembled into complete infrared ovens, and include full insulation and electric bus.

First issue of a new pocket-size, three color publication called **"Chemmunique"** is made available to the executives of chemical process industries by Atlas Powder Company, Wilmington 99, Delaware. The publication, to be issued on alternate months, presents helpful information on new and old uses of Atlas chemical products and Darco activated carbons, written in non-technical fashion and illustrated with color cartoons.

The first issue, for example, includes short stories of cost-saving applications of chemical products in such fields as dentrifices, candy, filtration, solidification of essential oils and liquid medicinals, vitamins, decolorizing, removal of starch residues, and use of polyester resins for glass fiber reinforced plastics.

Metasurf Leaflet. Produced by Metasurf Corp., 12830 Eaton Ave., Detroit 27, Mich., a 4-page folder listing and describing the various products of the company. Some of the general listings are alkali cleaners, emulsion cleaners, phosphate coatings, spray booth compounds, maintenance cleaners.

On any steel blackening problem

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Miracle Midget. Available from the Miracle Paint Rejuvenator Co., 500 N. Robert St., St. Paul 1, Minn., is a catalog sheet illustrating and describing the Miracle Midget Paint Mixer and Rejuvenator. The sheet also lists the features and specifications of the Miracle Midget.

Bulletin 516, published by The New York Blower Co., 3166 S. Shields Ave., Chicago 16, Ill., illustrates a Comet vertical, projection type unit heater with six-blade adjustable diffuser, and lists the construction features. Various capacity tables and sketches of the design and piping details are included.

Copper-Oxide Rectifier Stacks. Issued by the Apparatus Sales Div., General Electric Co., Schenectady, N. Y., this eight-page, illustrated bulletin describes the construction and characteristics of G-E copper oxide recifier stacks. Typical applications for the products are listed, features are outlined, and ratings of copper oxide rectifier cells are included.

Multiple Unit Tumbling Barrel Bulletin. Tumb-L-Matic, Inc., 4510 Bullard Ave., New York 70, N. Y., offers **Bulletin MU-52** on its line of Multiple Unit tumbling barrels for high production deburring, cutting, and finishing of wood, plastic, and metal parts.

The bulletin explains how several barrels mounted on one frame are driven by one motor and how any one barrel may be stopped for emptying or filling without interrupting the operation of the others. It gives information on drive, sizes, types, and includes pictures of horizontally-mounted and vertically-mounted models.

A table of specifications lists standard model numbers, dimensions, number of tumblers per frame, and number of compartments per tumbler. Tumblers are available for wet or dry tumbling or a combination of both.

The bulletin also includes a section on the Pocket Tumbler, a barrel divided into a number of separate pockets for carrying out multiple finishing operations in one barrel.

The bulletin contains recommendations on the right compounds to use for various operations in wet and dry tumbling.

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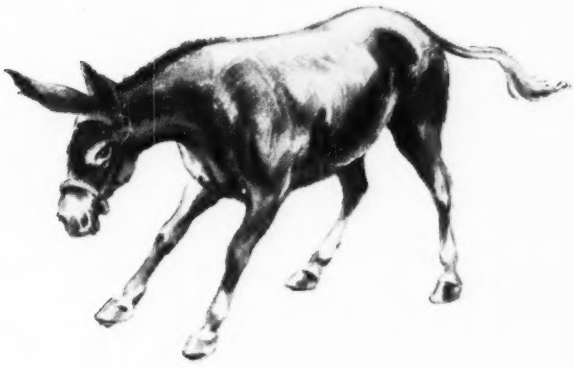
Jenny doesn't live here any more!



YES, in the modern coal mine there's no room for Jenny. Today, powerful electric locomotives pull 50 times the load that Jenny hauled to the mine surface.

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But, basically, what caused Jenny to disappear? What's behind American industry's ever-more efficient machines that turn out goods at lower cost—thus making them available to more people? One word tells the story—COMPETITION.

In the coal industry 5,000 privately managed coal companies compete with one another. When one company develops more efficient methods, the rest can keep pace only by striving to improve even further. No wonder that, with his modern machines, the American miner's daily output is 4 to 24 times that of any miner in Europe or Asia—most of whom work in government-controlled coal industries.

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Competition—not government control—has already made America the most productive nation on earth. Competition—not regimentation—points the way to ever greater plenty for all of us.

★ ★ ★

This report on PROGRESS-FOR-PEOPLE is published by this magazine in cooperation with National Business Publications, Inc., as a public service.

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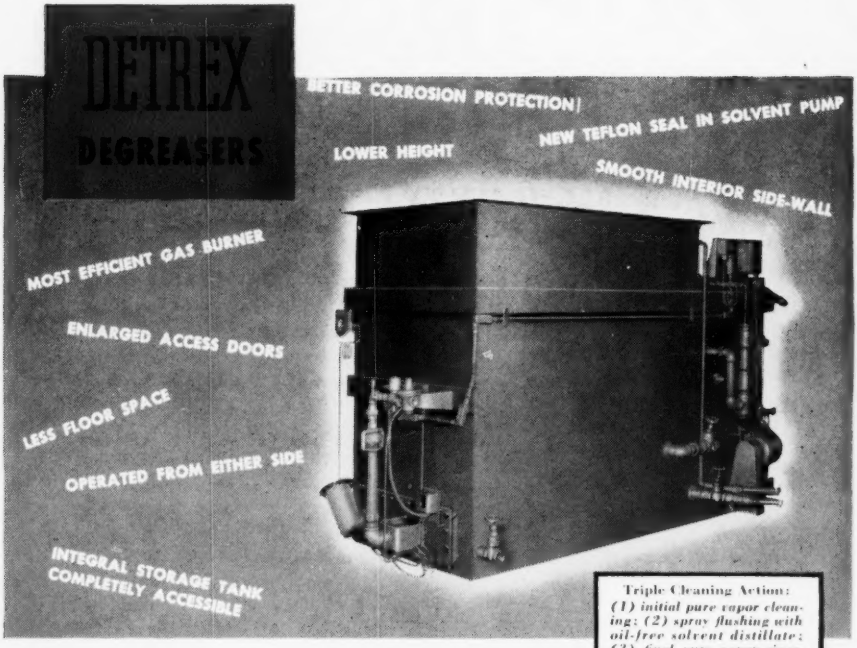
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